S. HRG. 101-993

# WESTERN WATER POLICY REVIEW ACT

## HEARING

BEFORE THE

SUBCOMMITTEE ON WATER AND POWER

OF THE

## COMMITTEE ON ENERGY AND NATURAL RESOURCES UNITED STATES SENATE

ONE HUNDRED FIRST CONGRESS

SECOND SESSION

ON

## S. 1996

TO PROVIDE FOR A COMPREHENSIVE REVIEW BY THE SECRETARY OF THE INTERIOR OF WESTERN WATER RESOURCE PROBLEMS AND PROGRAMS ADMINISTERED BY THE GEOLOGICAL SURVEY, THE BUREAU OF RECLAMATION, AND OTHER OPERATIONS OF THE DEPARTMENT OF THE INTERIOR, AND FOR OTHER PURPOSES

PORTLAND, OR, AUGUST 27, 1990

Printed for the use of the
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# WESTERN WATER POLICY REVIEW ACT

MONDAY, AUGUST 27, 1990

U.S. SENATE,
SUBCOMMITTEE ON WATER AND POWER,
COMMITTEE ON ENERGY AND NATURAL RESOURCES,
*Portland, OR.*

The subcommittee met, pursuant to notice, at 10:10 a.m., at the Red Lion Inn, Jantzen Beach, Hon. Mark O. Hatfield, presiding.

## OPENING STATEMENT OF HON. MARK O. HATFIELD, U.S. SENATOR FROM OREGON

Senator HATFIELD. Our hearing will come to order. If anyone has difficulty in hearing, please signal because I am not quite certain of the acoustics here at this moment.

We are here today under the auspices of the Senate Energy and National Resources Committee to discuss S. 1996, what is referred to as the Western Water Policy Review Act legislation that I introduced during the last session of the 101st Congress in an attempt to deal with what I see as a growing and more complex problem of Federal water policy.

Before we begin, for the record I would like to thank the chairman and ranking member of the Water and Power Subcommittee, Senator Bill Bradley of New Jersey and the ranking minority member, Senator Conrad Burns of Montana, for their help in putting together this hearing and for their very personal and continued interest in this subject.

Also with us today is Bill Conway, who is the majority committee counsel for the full Senate Energy and National Resources Committee and who represents the utmost in professionalism.

And when we use terms majority and minority side of subcommittees, it is a very appropriate distinction. And with other committees it is but an anomaly that we carry over from political nomenclature. In this case, I would say no minority member of our committee feels any differently from any of the majority staff than the majority members because their degree of professionalism transcends any difference between the R's and D's that follow the names of the members.

Anne Svoboda, a majority professional staff member for the Water and Power Subcommittee, is with us today, as well as Jim Beirne, who is a minority staff counsel for the full committee, Pat Reiten, my legislative assistant from Washington, DC, and Marie Rietmann, a staff assistant from my Portland office. I make mention of these fine staff people because more often than not any time we members look good it is because of the staff and when we

look bad it is because we have wandered far away from our staff. I am pleased to have these fine people as this hearing proceeds.

Now, for those of you unfamiliar with my bill, let me explain the premise upon which the bill was based and for the reasons that it was introduced.

There are at least 13 congressional committees, including this committee, which deal with water resource issues within the Congress alone. In the Executive Branch, there are eight Cabinet level departments. I repeat, eight Cabinet level departments and six independent agencies and two White House offices charged with responsibilities relating to national water management policy.

I invite you to take a look at this chart over here to the left. Because in that kind of scramble, you see the agencies and the supposed interrelationships that deal with water policy. I could use the word convoluted and be polite, but I could use far more dramatic words and be vulgar. But that is the so-called Federal chart of administrative relationships and responsibilities dealing with the single resource water.

It is easy to see how this situation has evolved, because we all first thought our water supply was unlimited. And a number of entities were independently formed to take care of a wide variety of different water related policies, all with certain focus, emphasis and with, of course, the turf that goes with it. Now, since they were making decisions affecting only a small part of a large resource, agencies believed they could operate in a vacuum, in effect, assuming there was plenty of water left to fulfill a multitude of other purposes.

This is the classic approach of natural resource management in this country. And that is, how to divide the pie. And oftentimes, therefore, few have the overall pie in mind, but only their piece of the pie. In that, we see that creates new bureaucracies. And while this approach clearly meets bureaucratic needs, it does not meet the public needs. And with water, without which life cannot survive, it is unacceptable. My friends, the day of charts like these is over and the sooner we realize this the more effective we will be able to manage the resource which is so vital.

Unfortunately, even though the various instream and consumptive uses of our water supply are increasing daily the myth of an unending supply lives on. And let me give you an example.

Recently a Los Angeles City County Commissioner suggested that 90 billion gallons of water dumped into the Pacific Ocean daily by the Columbia River was "surplus" and, therefore, should be diverted to water the lawns and fill the swimming pools of southern California. Unfortunately, the commissioner seems blind to the instream uses of the Columbia River's water, which includes power production, fish enhancement, irrigation, and recreation just to name a few.

Prudent water policy balances all of these uses and more. And this leads us to some of the questions I intend to pose to our distinguished panelists here today: is it possible for a decision making structure which is this fragmented to lead to the development of a balanced Federal water policy? Or do the overlapping and competing jurisdictions represented on this chart result in imprudent

management of our water resources—handling a scarce resource inefficiently?

S. 1996 was drafted under the latter assumptions. It establishes a 5-year commission to review all Federal programs and agencies which deal with water policy and is required to recommend whether they should be continued, merged, modified or eliminated.

The bill also requires a review of the history and effectiveness of past institutional water policy arrangements and whether additional storage or other water projects are needed. The lack of a coordinated and comprehensive water policy is of particular concern to the Western United States, a region whose history was built, in large part, because of the search for water and whose future is inextricably tied to the availability of water. While my bill addresses only western water policy, water policy coordination is ultimately a national responsibility.

Accordingly, I have drafted an alternative bill which would expand the scope of S. 1996 to consider the national dimensions of the problem. Given sufficient interest from Congressional members around the country, I would gladly welcome an expansion of my bill for that purpose. And I might say, procedurally, this bill was drafted for western purposes only in order to make sure that the committee best equipped, from my perspective, would have jurisdiction of the bill. We can expand this bill very easily to a total national perspective, which we will probably ultimately do.

It seems clear to me that with better coordination we can have better efficiency. And with better efficiency we can avoid a water crisis that is looming large and fast, one which will dwarf the energy crisis we faced in the 1970's—or the energy crisis we may be facing now. Once again, just like oil we cannot create new water resources—we must better manage those we have. And this starts with having a better decision making structure.

Before I call our first witness this morning, I would like to discuss the procedure the subcommittee will follow in this hearing. As you can see from the witness list, all of you will be speaking in panels. Now, this format helps us to save time and organize the testimony. And let me emphasize that appearing on a particular panel does not mean that you necessarily agree with all the other members of the panel who will be participating. All of your views will be considered individually regardless of this particular format.

Now, when the panel is called, please come to the witness table here directly in front as soon as possible and please hold on to your written statements until the panel is called. And the staff will then collect your statements as you come forward. If you are not testifying, but have a written statement or letters for the hearing record, please give them to a staff member any time during the proceedings.

And because we have only 3 hours for today's hearing I will ask that your oral testimony be no longer than 5 minutes and your full written record statement, however, will be included in the hearing record. First, we will be innovative today. My chief assistant here, counsel for the committee, will innovate by either pounding once for your warning of 1 minute left and twice for the fact that your time is up. I will give him the gavel.

We will continue, of course, to hold the record open for at least 2 weeks. And within that 2-week period we want you to feel free to submit further testimony and further statements or you may bring or send them to my office here in Portland in the Pioneer Courthouse or to the Senate Energy and Natural Resources Committee in Washington, D.C.

Again, I would like to thank each of you for your presence and with that brief introduction I would like to invite the State and regional organizations who are represented here today, Mr. Bill Young, the director of and the current president of the Western States Water Council, Benno Warkentin, the director of water research institute of Oregon State University, and Paul Cunningham, the executive director of the Western Governors Association. Gentlemen, please proceed, as you will, to either highlight or to summarize your statement and we welcome you.

Mr. Young.

[The text of S. 1996 follows:]

101ST CONGRESS
1ST SESSION

# S. 1996

To provide for a comprehensive review by the Secretary of the Interior of western water resource problems and programs administered by the Geological Survey, the Bureau of Reclamation, and other operations of the Department of the Interior, and for other purposes.

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IN THE SENATE OF THE UNITED STATES

NOVEMBER 22 (legislative day, NOVEMBER 6), 1989

Mr. HATFIELD introduced the following bill; which was read twice and referred to the Committee on Energy and Natural Resources

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# A BILL

To provide for a comprehensive review by the Secretary of the Interior of western water resource problems and programs administered by the Geological Survey, the Bureau of Reclamation, and other operations of the Department of the Interior, and for other purposes.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That this Act may be cited as the "Western Water Policy Review Act of 1989".

CONGRESSIONAL FINDINGS

SECTION 1. The Congress finds that—

(1) the Nation needs an adequate water supply for all States at a reasonable cost;

(2) the demands on the Nation's finite water supply are increasing;

(3) coordination on both the Federal level and the local level is needed to achieve water policy objectives;

(4) not less than fourteen agencies of the Federal Government are currently charged with functions relating to the oversight of water policy;

(5) the diverse authority over Federal water policy has resulted in unclear goals and an inefficient handling of the Nation's water policy;

(6) the conflict between competing goals and objectives by Federal, State, and local agencies as well as by private water users is particularly acute in the nineteen Western States which have arid climates which include the seventeen reclamation States, Hawaii, and Alaska;

(7) the appropriation doctrine of water allocation which characterizes most western water management regimes varies from State to State, and results in many instances in increased competition for limited resources;

(8) the Federal Government has recognized and continues to recognize the jurisdiction of the several

States over the allocation, priority, and use of water resources of the States and that the Federal Government will, in exercising its authorities, comply with State laws;

(9) Federal agencies, such as the Bureau of Reclamation, have had, and will continue to have major responsibilities in assisting States in the wise management and allocation of scarce water resources; and

(10) the Secretary of the Interior, given his responsibilities for management of public lands, trust responsibilities for Indians, administration of the reclamation program, investigations and reviews into ground water resources through the Geologic Survey, should initiate a comprehensive review, in consultation with appropriate officials from the nineteen Western States, into the problems and potential solutions facing the nineteen Western States and the Federal Government in the increasing competition for the scarce water resources of the Western States.

SECRETARIAL REVIEW

SEC. 2. (a) The Secretary of the Interior is directed to undertake a comprehensive review of Federal activities in the nineteen Western States which directly or indirectly affect the allocation and use of water resources, whether surface or subsurface and to submit a report on his finding, together

with his recommendations, to the President, the President of the Senate, and the Speaker of the House of Representatives.

(b) Such report shall be submitted within five years from the date of enactment of this Act.

(c) In conducting his review and preparing his report, the Secretary is directed to consult with the Advisory Commission established under section 3 of this Act, and may request the Commission to undertake such studies or other analyses as he determines would assist in his review.

(d) The Secretary shall consult periodically with the Commission, and upon the request of the Secretary, the heads of other Federal agencies are directed to cooperate with and assist the Commission in its activities.

THE ADVISORY COMMISSION

SEC. 3. (a) There is established the Western Water River Commission (hereafter in this Act referred to as the "Commission").

(b) The Commission shall be composed of fourteen members, as follows:

(1) The ranking majority and minority member from the Senate Committees on Energy and Natural Resources and Appropriations.

(2) The ranking majority and minority member from the House Committees on Appropriations and Interior and Insular Affairs.

(3) Six persons who are not now, and for a period of one year immediately preceding their appointments, have not been, officers or employees of the United States; but, the foregoing or any other provision of law notwithstanding, there may be appointed under this paragraph, any person who is retained, designated, appointed, or employed by any instrumentality of the executive branch of the Government or by any independent agency of the United States to perform, with or without compensation, temporary duties on either a full-time or intermittent basis for not to exceed one hundred and thirty days during any period of three hundred and sixty-five consecutive days; said persons shall be appointed by the President of the United States.

(4) Of the aforementioned Commission members, one shall be elected, by majority vote, to serve as Chairman of the Commission (hereafter in this Act referred to as the "Chairman").

(c) Any vacancy which may occur on the Commission shall not affect its powers or functions but shall be filled in the same manner in which the original appointment was made.

(d) The organization meeting of the Commission shall be held at such time and place as may be specified in a call

issued jointly by the ranking majority and minority members of the Commission of both the Senate and the House of Representatives.

(e) Ten members of the Commission shall constitute a quorum, but a smaller number, as determined by the Commission, may conduct hearings.

(f) Members of Congress who are members of the Commission shall serve without compensation in addition to that received for their services as Members of Congress; but they shall be reimbursed for travel, subsistence, and other necessary expenses incurred by them in the performance of the duties vested in the Commission.

(g) The members appointed by the President shall each receive a per diem in the amount equal to the daily rate of pay for a GS-18 position on the executive schedule when engaged in the actual performance of duties vested in the Commission, plus reimbursement for travel, subsistence, and other necessary expenses incurred by them in the performance of such duties.

DUTIES OF THE COMMISSION

SEC. 4. (a) The Commission shall—

(1) review present and anticipated national water resource problems affecting the nineteen Western States, making such projections of water requirements as may be necessary and identifying alternative ways of meeting these requirements—giving consideration,

among other things, to conservation and more efficient use of existing supplies, innovations to encourage the highest economic use of water and recent technological advances;

(2) examine the current Federal programs affecting such States and recommend to the Secretary whether they should be continued and, if so, how they should be managed for the next twenty years, including the possible reorganization or consolidation of the current water resources development and management agencies;

(3) review the need for additional storage or other arrangements to augment existing water supplies;

(4) review the history, use, and effectiveness of various institutional arrangements to address problems of water allocation, water quality, planning, flood control and other aspects of water development and use, including interstate water compacts, Federal-State regional corporations, river basin commissions, the activities of the Water Resources Council, municipal and irrigation districts and other similar entities with specific attention to the authorities of the Bureau of Reclamation under reclamation law;

(5) review the legal regime governing the development and use of water and the respective roles of

both the Federal Government and the States over the allocation and use of water, including an examination of riparian zones, appropriation and mixed systems, market transfers, administrative allocations, ground water management, interbasin transfers, recordation of rights, Federal-State relations including the various doctrines of Federal reserved water rights (including Indian water rights and the development in several States of the concept of a public trust doctrine); and

(6) review the activities, authorities, and responsibilities of the various Federal agencies with direct water resources management responsibility, including but not limited to the Bureau of Reclamation and those agencies whose decisions would impact on water resource availability and allocation, including, but not limited to, the Federal Energy Regulatory Commission.

GOVERNOR'S REPRESENTATIVES

SEC. 5. The Chairman of the Commission shall invite the Governor of each State to designate a representative to work closely with the Commission and its staff in matters pertaining to this Act.

INTEREST GROUP REPRESENTATIVES

SEC. 6. The Commission, at its discretion, may invite appropriate public or private interest groups to designate a

representative to work closely with the Commission and its staff in matters pertaining to this Act.

POWERS OF THE COMMISSION

SEC. 7. (a) The Commission may—

(1) hold such hearings, sit and act at such times and places, take such testimony, and receive such evidence as it may deem advisable;

(2) acquire, furnish, and equip such office space as is necessary;

(3) use the United States mails in the same manner and upon the same conditions as other departments and agencies of the United States;

(4) without regard to the civil service laws and regulations and without regard to chapter 51 of title 5, United States Code, employ and fix the compensation of such personnel as may be necessary to carry out the functions of the Commission;

(5) procure services as authorized by section 3109 of title 5, United States Code, at rates not to exceed an amount equal to the daily rate of pay for a GS–18 position on the executive schedule;

(6) purchase, hire, operate, and maintain passenger motor vehicles;

(7) enter into contracts or agreements for studies and surveys with public and private organizations and transfer funds to Federal agencies to carry out such as-

pects of the Commission's functions as the Commission determines can best be carried out in that manner; and

(8) incur such necessary expenses and exercise such other powers as are consistent with and reasonably required to perform its functions under this title.

(b) Any member of the Commission is authorized to administer oaths when it is determined by a majority of the Commission that testimony shall be taken or evidence received under oath.

POWERS AND DUTIES OF THE CHAIRMAN

SEC. 8. (a) Subject to general policies adopted by the Commission, the Chairman shall be the chief executive of the Commission and shall exercise its executive and administrative powers as set forth in paragraphs (2) through (8) of section 6(a).

(b) The Chairman may make such provision as he shall deem appropriate authorizing the performance of any of his executive and administrative functions by the Executive Director or other personnel of the Commission.

OTHER FEDERAL AGENCIES

SEC. 9. (a) The Commission may, to the extent practicable, utilize the services of the Federal water resource agencies.

(b) Upon request of the Commission, the Secretary may request the head of any other Federal department or agency

to assist the Commission and such head of any Federal department or agency is authorized—

(1) to furnish to the Commission, to the extent permitted by law and within the limits of available funds, including funds transferred for that purpose pursuant to section 4(a)(7) of this Act, such information as may be necessary for carrying out its functions and as may be available to or procurable by such department or agency, and

(2) to detail to temporary duty with this Commission on a reimbursable basis such personnel within his administrative jurisdiction as it may need or believe to be useful for carrying out its functions, each such detail to be without loss of seniority, pay, or other employee status.

(c) Financial and administrative services (including those related to budgeting, accounting, financial reporting, personnel, and procurement) shall be provided the Commission by the General Services Administration, for which payment shall be made in advance, or by reimbursement from funds of the Commission in such amounts as may be agreed upon by the Chairman of the Commission and the Administrator of General Services, except that—

(1) the regulations of the General Services Administration for the collection of indebtedness of per-

sonnel resulting from erroneous payments (5 U.S.C. 5514) shall apply to the collection of erroneous payments made to or on behalf of a Commission employee, and regulations of such Administrator for the administrative control of funds (31 U.S.C. 655(g)) shall apply to appropriations of the Commission; and

(2) the Commission shall not be required to prescribe such regulations.

APPROPRIATIONS

SEC. 10. There are hereby authorized to be appropriated not to exceed $18,000,000 to carry out the purposes of this Act.

**STATEMENT OF WILLIAM H. YOUNG, DIRECTOR, OREGON WATER RESOURCES DEPARTMENT AND CHAIRMAN, WESTERN STATES WATER COUNCIL**

Mr. YOUNG. Thank you, Senator. I do appreciate the opportunity to be here today. My name is Bill Young. I am the director of the Oregon Water Resources Department. I am also currently the chairman of the Western States Water Council. And I appreciate the opportunity to appear and offer some limited comments on behalf of both the State of Oregon and the Western States Water Council.

First, as to the Western States Water Council, it is interesting that the Western States Water Council celebrated its 25th anniversary this summer. Senator Hatfield, it is testimony, I guess, to your longstanding interest in water management that you, as Governor of the State of Oregon, you were involved in putting together that organization initially. And today, just as it did when it was first started, the Western States Water Council serves its member States by providing a forum for addressing water issues that are of importance to the West.

The Western States Water Council has not adopted a formal position on S. 1996. Now, we were first exposed to that measure, Senator, as you recall, about a year ago, when you gave a speech to the council when we were in Washington, DC. Since that time our Water Resources Committee has reviewed the bill after it was drafted and we saw copies of it. And while no specific position has been taken, there were two issues that were discussed by that committee that I thought I would forward to this hearing today.

The first is that any study effort that we undertake makes sure that it adds to and does not simply duplicate other already previously done studies and that as an adjunct to that, recommendations to come out of such a study group ought to be in a position where they can be implemented, which from the viewpoint of State water managers, has not always been the case of those studies that have gone forward at the Federal level.

The second issue is—and not a surprising one, I suppose, given the comment that came from a group of Western States—and that is, as we look at a truly national water policy, the nature of the role between States and Federal Government be as clearly defined as we can and that States be given a good opportunity to participate in that discussion. The council is encouraged that there is interest in looking at water management issues at the Federal Government. It is an indication, I guess, of the shared interest of the Western States Water Council and the kind of issues that are highlighted in S. 1996 that this fall the council will be sponsoring a water management symposium that is going to deal with inter-regional water management and interstate and interbasin transfers of water.

The State of Oregon, too, welcomes the interest in water matters that is expressed in this bill. The Federal Government is involved in water management, as the chart suggests, in many and diverse ways. Now, some are peculiar to the appropriation States of the West, but many others, particularly the substantial body of environmental law that was passed within the last 15 years and in

some cases has been reauthorized, really applies nationally and with equal application around the Nation. For that reason I think the State of Oregon would encourage a strong look at whether or not the bill ought not be expanded to really take on a national scope rather than being directed simply to those issues that might be peculiar to the appropriation States of the West.

There are more examples of issues and decisions relating to water where a high coordination between the various Federal agencies is important. Beyond that, an understanding of how those Federal activities related to State and regional responsibilities is critical.

One example, amongst many that one could choose, is the current discussion of potential listing of several species of Columbia and Snake River salmon as potentially threatened or endangered. If one compiled a list of the tribal, State, regional and Federal agencies, all of whom have some role in managing water on the Columbia River, the listing that you would make is an intimidating one indeed. The possible consequences to these many varied management interests, depending on what course of action is taken in this threatened endangered species, are very substantial.

And as you pointed out, Senator, in an interesting twist of irony, just as we are looking at the question of the adequacy of the Columbia River to do all the work and recreational activities and sport habitat that we are interested in now, we have the discussion as to whether or not there ought not be a substantial diversion of water from the Columbia River that are viewed, in some way or another, to be surplus by folks who hold a decidedly different view of the role of the Columbia River than do those of us who live and have some role of management.

The kind of study envisioned by this bill would not, unfortunately, be done in time to address this issue, but it certainly appears to be an issue or activity that would stand us in good stead for similar issues that are bound to come up in the future.

One last example and a very current example of the need for such a review is the current tension that exists between many State water management agencies—it is certainly true of the State of Oregon—and the responsibilities given to the Federal Energy Regulatory Commission.

Senator, I think you have received, from Governor Goldschmidt within the last week, a letter detailing the State's activities involved with a particular project in the southern part of the State. I did not propose to burden the record by bringing that and its attachments with me today, but it is there. Whatever the outcome of the immediate discussion that we are having, I think Oregon is convinced that it will be Congress that is going to have to resolve the jurisdictional disputes between the Federal Energy Regulatory Commission and whatever responsibilities that it has been given and the water management agencies and activities that the States have responsibility for.

The greatest need for such a review, as is proposed in this bill, of course, is not simply to resolve these present issues, but it is to improve our ability to better manage this resource of water. Water is, in fact, the basic necessity of life. And as such, it deserves our best management efforts. The State of Oregon and, I am sure, the West-

ern States Water Council would look forward to further participation in the development of this bill or other vehicles of that end.

Senator, thank you very much for hearing this testimony.

[The prepared statement of Mr. Young follows:]

PREPARED STATEMENT OF WILLIAM H. YOUNG, DIRECTOR, OREGON WATER RESOURCES DEPARTMENT AND CHAIRMAN, WESTERN STATES WATER COUNCIL

I am Bill Young, director of the Oregon Water Resources Department. I am also currently the chairman of the Western States Water Council (WSWC). I appreciate the opportunity to offer some comments on behalf of both organizations.

The Western States Water Council observed its 25th anniversary this summer. Senator Hatfield, it is testimony to your longstanding interest in water management that you, as Governor of the State of Oregon, were instrumental in the creation of the council. Today, as was true when it started, the council serves its member States as a forum for addressing water issues of importance to the west.

The WSWC has not adopted a position on S. 1996. The measure has been discussed in the council's water resources committee, and two specific issues have been highlighted. The first is that any study effort add to, and not simply repeat, previous study efforts and that recommendations coming from such a study be implemented. The second is that, in a study such as is proposed, States be given an adequate opportunity to participate. The council is encouraged that there is an expressed congressional interest in reviewing water management activities of the Federal Government. It is an indication of the shared interest of the WSWC and the issues highlighted in S. 1996 that a WSWC-sponsored water management symposium scheduled for this fall will deal with inter-regional water management and interstate and interbasin transfers.

The State of Oregon welcomes the interest in water matters expressed in S. 1996. The Federal Government is involved in water management in many ways. Some are peculiar to the appropriation doctrine States. Many others, particularly the substantial body of environmental statutes that have been enacted, and in some causes reauthorized, have equal application across the Nation. For this reason, we would encourage careful examination to determine whether a broader, national application of such a study effort might not be appropriate.

There are many examples of issues and decisions relating to water where a high level of coordination among the many Federal programs is needed. Moreover, an understanding of how those Federal activities and programs relate to State and regional responsibilities is critical. One such example, among many, is the current discussion of potential listing of several species of Columbia and Snake River salmon as threatened or endangered. A compilation of the tribal, State, regional and Federal agencies who have some responsibility for management of Columbia River water is intimidating. The possible consequences to these many, varied interests, depending on what course of action is taken, are substantial. And, in an interesting twist of irony, at the same time we have the spectre raised of major diversion of Snake and Columbia River waters. The kind of study envisioned by S. 1996 would not, unfortunately, be done in time to address this issue but would serve well for other such issues in the future.

One more current example of the need for such a review is the tension between State water management responsibilities and the responsibilities given to the Federal Energy Regulatory Commission (FERC). Senator Hatfield, you have recently received a letter dated August 21, 1990, from Governor Goldschmidt detailing the efforts of the State of Oregon in reviewing the Salt Caves Hydroelectric proposal. Whatever the outcome of this immediate discussion, I am convinced that it is Congress who will have to resolve the jurisdictional dispute between FERC and State water management agencies.

The greatest need for such a review is not to resolve present issues but to improve our ability to better manage this resource. Water is, in fact, a basic necessity of life itself and, as such, deserves our best management efforts. The State of Oregon and the WSWC look forward to further participation in the development of S. 1996 to further that end.

Senator HATFIELD. Thank you. I am going to proceed to ask questions of each witness to keep the subject in the focus of that presentation rather than waiting till the entire panel, if that is all right.

Mr. Young, what portion is controlled of Oregon's water supply, taking just Oregon's water supply? How do you divide the control factors between the Federal and State as the agencies of each are represented? In other words, I am trying to find out here, just for the record what percentage is apportioned by the State, against that which is controlled by the Federal Government. Could you give us an estimate of that division?

Mr. YOUNG. I am afraid, Senator, I cannot come with a very good figure, even a very good description of that. Certainly, when we deal with interstate waters and waters of critical nature of navigation and other things, folks like the Corps and others play a very strong role. That would simply apply to the Columbia River. And you are well aware of the strong responsibilities that the Corps has in terms of management of reservoirs and storage for flood control and other purposes of the Willamette and in the Rogue system.

Similarly, the Bureau of Reclamation has been a strong player in the State of Oregon; although, not on the grand scale that we have seen in other dryer States. And the Bureau of Reclamation continues to be an important partner in the discussion of water management in the State of Oregon.

Although, in the case of the Bureau, as you well know, they have always comported well with requirements of State water law and the work that they do is customarily done within the confines and limitations of the water management system that the State of Oregon has. That is not necessarily true of folks like the Corps. That is not necessarily true of organizations like the Federal Energy Regulatory Commission.

So one would have to make a further division between those Federal activities that regularly comport and square well with State management activities on water and those that based on their Federal authorizations, tend to cut their own track.

Senator HATFIELD. Of course, as the founding of our Western Waters Council, we have had a tremendous shift in the situation on allocations not only in the Supreme Court, but in Patrice Coulee. But the laws that we have enacted at the Federal level that relate and impact upon that water use, such as endangered species, which you have mentioned, with the five, seven and probably about five more that we just assume. And so those are constantly changing allocations in uses of the water supply.

You know, we do an awfully good job up here beating up on California for suggestions about water transfer and so forth and so on. Nevertheless, I foresee that California has done some very innovative things in the field of water conservation, forced by reality or whatever reasons.

Let me ask how you would assess the corresponding work that we have done in the Northwest and more especially Oregon in a parallel fashion dealing with conservation. Could the Californian come up and say, "Look, we could get better utilization out of this water than what you are getting as far as conservation and utilization out of the water which you now control?"

Mr. YOUNG. We, I think, Senator, would share the general view that you have expressed, that when Oregon looks for ways to deal with conservation of water, we very frequently will look to States like California and more recently in the groundwater area of Arizo-

na as States that have had visited on them, certainly by the necessity of supply, a hard look at conservation activities. And in both States, I think you can find examples of conservation activities that have gone beyond the activities that we have pursued here in Oregon.

On the other hand, I think there is kind of a flip side to that where we have attempted to do some things in water conservation that may be somewhat of a different approach and as a result they may be things that California and Arizona, for instance, have not undertaken.

One of our newest efforts has been to try and break away from the classic representation of the old western water law, the use it or lose it notion, that if you conserve water, somehow or another you are only disadvantaging yourself because it will be lost back in the system and you have no benefit from it. Now, our legislature, in 1987, passed a law that tried to give some of the benefit of that conserved water back to the party who invested the money in conserving. And that might either be a public entity or it might be the private party.

We are in the process of trying to sort our way through the first of those applications. It is, as you might imagine, not an uncomplicated issue to try to resolve that. I have been working with an irrigation district up in the Hood River basin area now. We had such an application before us, an organization that saved a considerable amount of water that they previously had been diverting. And we, in our commission, will now be trying to sort through how to divide that out. That is an approach that appears to be novel to the State of Oregon, one that we have tried where other entities and other States have not been quite prepared to take on that bold a shot, I guess you would say, have the classic prior appropriation doctrine, the use it or lose it kind of approach. So once again, it seems to me that it is kind of a mixed report we give you on that.

Senator HATFIELD. Mr. Young, 25 years ago, when I was involved in launching the Western Water Council, in part, it was a response to Governor Pat Brown's constant reminder at the Western Governors Conference that his was a fast growing State with a tremendous increase in population. He was wanting water, at that point, to irrigate land to produce the food materials to feed the population. I can remember those arguments over and over again. My response was usually, "You send us your grocery list and we will grow the food and sell it to you far cheaper than diverting our water."

I have just come back from a trip around the eastern part of our State, driving through miles and miles of sagebrush. And then I saw some of that same adjoining land, once that you put water on it and how it produced tomatoes and vegetables and everything else that could go into a food market. But I also am conscious, in the last 25 years, a lot of those valleys in which Pat Brown, Governor of California, would have used to irrigate food are now being blacktopped and being taken out of agricultural production, which puts pressure all the more on the lands available that could, with water, produce foodstuff for the region or the world, for that matter, to integrate that into the total land use programs of our region.

So oftentimes I do not feel that we are using water interrelated to agriculture, interrelated to population, interrelated to industry, all the other uses. And I just want to draw attention to the fact that in this 25 year period, there has been a lot of changes in this interrelationship between the Southwest and the Northwest. And I am aware that Parsons report—back in those days, we used to boast about the engineering feasibility. The Parsons engineering firm—where is it located, California? Anyway, they did a feasibility study of transferring water from Alaska down through Canada down the whole Western coast of the United States into Mexico with a series of canals and pipes. And so from Oregon's south, you know, that was easy in comparison to that project. But what I am saying is that we have put an awful lot of focus on engineering transfer, in my view, without a data base on relating regional land use, water resources, requirements of food production and so forth.

Mr. YOUNG. Senator, I could not agree more. And the States are not—we do not take the same approach to those things. As you well know, here in the State of Oregon, we are vigorous in our efforts to preserve farmland, to keep it from being taken over by these kind of developments you are describing. It is interesting to me that in the critical groundwater areas of Arizona, the reverse is exactly the case. If we are going to have water devoted to those areas to urban and suburban activities, they are anxious that it come from an agricultural base, because to do otherwise would be to add to the demand for water rather than be a transfer of that demand. So it is interesting that you have two States, both of whom are doing their dead level best, I am sure, to sort through their problems and yet they come to very diverse kinds of approaches on that particular issue.

Senator HATFIELD. Thank you, Mr. Young. We may have other questions to submit to the witnesses. And if they could respond in writing quickly, we would appreciate that very much.

Dr. Warkentin.

Dr. WARKENTIN. Thank you.

Senator HATFIELD. Dr. Warkentin, from Oregon State University. Again, I do not know what we would do without the academic resources to call upon in these references, especially natural resources. We are awfully happy to welcome you today as the director of the Water Resources Research Institute.

## STATEMENT OF DR. BENNO WARKENTIN, DIRECTOR, WATER RESOURCES RESEARCH INSTITUTE, OREGON STATE UNIVERSITY

Dr. WARKENTIN. I thank you for the opportunity to appear before you in your very important deliberations on future western water policy. My name is Benno Warkentin. I am the director of the Oregon Water Resources Research Institute. I would like to say a sentence, first, about the institute and then raise the two general questions on future water policy, the two issues, I think, that need to be taken into account. One is water conservation that we have already touched on to a certain extent. The second one is building on the strengths and diversity of water uses that we have. I will not discuss specific institutional structures. I think there are others

from other panels that are more competent on that. I would like to discuss some of that background.

The Water Resources Research Institute is the interface between Oregon universities—there are about half a dozen of them involved between the research and teaching community involved with water in the universities and the users of water in Oregon, public and private users. The institute takes ideas, problems, concerns from the users to the university community and, in turn, then interprets the research results in workshops and publications and talks and so on to the users. That is its function. As part of a network of similar institutes, one in each State, our goal is sustained beneficial uses of water for the well-being of all Oregon citizens.

Back then to the future water policy. Two issues stand out as important to me in future water policy. And the institutional structure must be able to deal adequately with these. One is water conservation measures and the other is the local and sometimes even individual variation that we have in needs and best uses. This diversity is a fact in biological systems and it is also a strength. It has been, however, difficult, in the past, to handle the reality of biological diversity in our institutional structures.

Conservation of water is not a new or untried concept. There are many good individual conservation programs. What is lacking is a conservation policy that integrates all water uses that is seen to be fair, seen to be effective; hence, would have public support and that is part of the institutional structure. It must provide the institutional arrangements, must promote a conservation ethic as we move to management of water as a scarce resource from our present attitude of resource extraction of a free commodity. For example, we have only begun to develop the potential in aiding nature to store water underground for later uses such as augmenting late season stream flow. Multiple use and re-use, another aspect of conservation, is a present concept to be desired more than a reality that has been achieved.

Second issue: we must cope with year to year variability in available water, which leads to this issue of recognizing and working with diversity. There is diversity even within common uses. For example, water is withdrawn from the Columbia River system throughout a large length of the river for agricultural, irrigation work. Local climate, soils, irrigation systems, cropping systems lead to very different water requirements. An overall standard for water efficiency in irrigated agriculture would put some systems out of business and would discourage true efficiency in other systems, a small example of the diversity that we have to deal with. Institutional structures for water policy must recognize these differences and work effectively with them. We believe that one of the strengths of our Water Resources Research Institute system, which was set up 25 years ago with an institute at each State, is that such differences can be taken into account in our programs.

I have prepared a copy of these remarks. It also includes reference to a paper that I have written recently on "Oregon Water Resources Management Issues for the 1990's", which has somewhat more detail. This is being prepared by the Bureau of Government Research and Service, the University of Oregon, should be available in about 2 month's time.

[The prepared statement of Dr. Warkentin follows:]

PREPARED STATEMENT OF BENNO P. WARKENTIN, DIRECTOR, WATER RESOURCES RESEARCH INSTITUTE, OREGON STATE UNIVERSITY

Thank you for the opportunity to appear before you in your very important deliberations on future water policy in the west.

I will first describe, very briefly, the function of our Water Resources Research Institute and then raise two general questions that I believe must be part of the basis for future western water policy. The issues are water conservation, and building on the strengths of diversity in water uses. I will not discuss specific institutional structures, but rather the concepts on which these structures must be based.

The Water Resources Research Institute is the interface between Oregon universities research and teaching programs with the public and private water users in the State. It is part of a network of similar Institutes in each State. The Institute goal is sustained beneficial uses of water for the well-being of all Oregon citizens. We deal with the information base for water resources management. The Institute carries ideas, questions and problems from water users to the university research and teaching community and interprets research results for various groups of users through publications, workshops and talks.

Two issues stand out as important to future water policy. The institutional structure for water policy must be able to deal adequately with water conservation measures, and with the local and sometimes individual variation in both needs and best uses. This diversity is a fact in biological systems and is also a strength. It has been difficult in the past to handle biological diversity in our institutional structures.

Conservation of water is not a new or untried concept. There are many good, individual conservation programs. What is lacking is a policy that integrates all water uses, that is seen to be fair and effective, and that is part of the institutional structures. The need is to have "we" conserving rather than saying that "they" should be conserving. The institutional arrangements for water policy must promote a conservation ethic, as we move to management of water as a scarce resource from our present attitude of resource extraction of a free commodity. We have only begun to develop the potential in aiding nature to store water underground for later uses, such as augmenting late-season stream flow. Multiple use and re-use, another aspect of conservation, is at present a concept to be desired, more than a reality that has been achieved.

We must cope with year to year variability in available water, which leads to the second issue, that of recognizing and working with diversity. There is diversity even within common uses. For example, water is withdrawn for agricultural uses from various parts of the Columbia River drainage system. Local climate, soils, irrigation systems and cropping systems lead to different water requirements. An overall standard for water efficiency in irrigated agriculture would put some systems out of business and would discourage true efficiency in other systems. Institutional structures for water policy must recognize these differences and work effectively with them. One of the strengths of the Water Resources Research Institute system, set up in 1965 with an institute in each State, is that such differences can be taken into account in our programs.

A description of these and other water issues will be available later this year in "Oregon Water Resources Management Issues for the 1990s," by B.P. Warkentin, to be published in Policy Choices, 1991, by the Bureau of Governmental Research and Service, University of Oregon, Eugene. In press.

Thank you for the privilege of appearing before you.

Senator HATFIELD. Do you have that paper, Dr. Warkentin, with you?

Dr. WARKENTIN. I do not have a copy of the paper with me.

Senator HATFIELD. I would appreciate very much having it.

Dr. WARKENTIN. I could send you the draft that I have submitted. I am expecting the reviews back any time. It has not yet gone through the review process. It is a document that is prepared for the Oregon legislature. It is to be ready late December, early January. I could get a copy.

Senator HATFIELD. Whether we incorporate it in the record, I do not know what your copyrights are and all that. But if we could have it at least for review, if not for reproduction in the record, we

would appreciate that very much, because it sounds like a dimension to this whole issue of projecting ahead. And I suppose that it includes the premise of being ready to make those projections valid that we will have to change structures or management policies to some degree.

I gather from what you say that you feel that we are managing pretty much the whole resource on a case-by-case basis instead of through a more coordinated process. Do you have a focus as to what basic unit we should key on, whether it is drainage or aquifers or river systems or basins or whatever? What is the framework? I am not sure I understand what you are proposing here as to a policy that would include the framework of Federal, State, all the other involvements here.

Dr. WARKENTIN. Yes. I was thinking there more of the diversity of uses. And each use seems to have its champion. We have had considerable success here locally with coordinated resource management where you can make some of these multiple use concepts work. In terms of a structure, yes, from, let us say, a water hydrologist's standpoint, systems, river basins have to be the basis on which you plan. But then even more than that you have to integrate the surface and the groundwater on that basin. You then have to have structures that deal with irrigation uses, with fisheries, with all of these uses together so that they do not become issues of contention among groups pushing their own agendas.

Senator HATFIELD. Dr. Warkentin, if my memory serves me right, when I was involved in getting this institute established at Oregon State University many years ago, the initial thrust was quality, to have an institute in which we were preserving a quality or we were recognizing the future of the quality relating to the uses. Could you just briefly outline and update me on the scope now of that institute in terms of either competing uses or future supply or any of the additional dimensions that evolved out of those original missions?

Dr. WARKENTIN. We have almost come full circle again. We spent a number of years worrying much more about quantity issues than quality issues. Now that water quality, specifically groundwater quality is a national issue, we have come back to that.

Senator HATFIELD. The original?

Dr. WARKENTIN. Yes. And universities, of course, follow trends of this kind because that is where the research money is. And so that is a part of recognition of that reality. But the issues in Oregon have been very strongly fisheries related issues for the past 15, 20 years. With structure of dams on the Columbia River for other purposes, transportation, for power generation has interfered with fisheries. So fisheries habitat has been a big concern of the local institute.

As we go from thinking not so much about raising fish and hatcheries and putting of somewhere and raising them, but to encouraging native wild fish, we become much more interested, again, in fish habitat. If you are raising fisheries stock, it is a different thing. If you are trying to encourage the wild fish—this is what the sports fishermen want now. And, again, as part of the diversity I was talking about, then you have to worry, again, about habitat. So riparian zone habitat has been the big issue, So fisher-

ies riparian zone habitat quantity. And Mr. Young will tell you about quantity and quality problems in Oregon. But we are coming back to recognize, first of all, that quality and quantity are always closely related and you have to deal with both of them. But right now the issues of water quality, issues right now are non-point sources of contamination, large land uses, agricultural, forestry in relation to groundwater. It was——

Senator HATFIELD. Of course, this raises so many other points that we do not have the time to go into this morning. I would like to some time get into a discourse with the water resource being interrelated to other resources. Because you bring up the fishery, which is the obvious. But as it relates to forestry. We have those environmentalists who would want a minimum management or no management of a forest resource areas with riparian problems or riparian values. And we have to interrelate those at times. If you are going to lose a major watershed out of a forest fire burn and then the desire is to do nothing or let it burn and do nothing after it has finished burning and not relate that to the impact on the water resource, you are preserving, supposedly, one environmental quality at the expense of another. And we get these competing groups that oftentimes have tunnel vision that they have only one resource and do not see the interrelationships of the other resources. Would you agree to that?

Dr. WARKENTIN. I would definitely agree to that, yes. That is the problem. It is the methods to deal with that, how can we set up institutional structures to handle that sort of thinking, which is the future of good water policy.

Senator HATFIELD. Sometimes, why, I would much rather move to a department of natural resources to at least bring under one umbrella the interrelationship of all those resources that I think we lose when we build our structures focusing on but one. You do not only get this kind of a problem, but you get the problem of tunnel vision dealing with the non-relationship, which cannot be. Thank you very much, Dr. Warkentin.

Paul Cunningham, the executive director of the Western Governors Association.

## STATEMENT OF PAUL CUNNINGHAM, EXECUTIVE DIRECTOR, WESTERN GOVERNORS ASSOCIATION

Mr. CUNNINGHAM. Thank you, Senator. I want to thank you and Senator Bradley for the invitation to testify on this important water governance. And the Governors, as you were recalling earlier 25 years ago you were involved in this, we continued to labor in these vineyards. And recently we have devoted considerable staff effort in regard to this issue. And let me just quickly tick off some of the things that we have uncovered in our efforts. First, that most States' water basins in the Federal Government failed to provide coordinated structures for consistent and timely water policy decisions. That failure has showed up partially in a pervasive inability to deal with water storage, water quality, and wetlands preservation and restoration.

The chart that you have displayed there I am happy to see is still being used. And there was a good bit of WGA effort that went

into that. And I want to thank your staff for returning it to the West. And if there is need for it further in D.C., we will happily return it there, but I think it does rather graphically display the problems which we face.

The problems which we identified were really of two sorts. One, intragovernmental coordination within the Federal Government and intergovernmental between State and Federal Governments. We found that no single Federal agency or committee in Congress has responsibility for looking at the big fish of Federal water policy. Over 40 Federal agencies and congressional committees or subcommittees have missions which involve water resource management. The chart that WGA put together very graphically demonstrates this mismanagement of authority and responsibility.

The Federal Government is a regulator, a water provider, a source of information, a technical assistant, a proprietor of reserved water rights, operator of facilities and manager of river systems resulting from hundreds of statutes spread over scores of offices and many committees. Single issue policymaking, lack of comprehensive planning and inadequate impact analysis have led to severe threats to various aspects of the hydrologic systems. Inefficiency appears rampant as a result of the redundancy functions among agencies that result in turf battles and protracted disputes. Fights between the Bureau and the Corps over water development, the Corps and EPA over wetland, the Bureau and EIA over tribal water rights, Fish and Wildlife Service and almost everyone on water projects have been repeated in almost every State in the Nation.

A result of the fragmentation is that no one can speak for the Federal Government or articulate Federal policy. Getting an answer, even a no, becomes next to impossible. There is always one more appeal, one more agency that has to sign off, one more run at a Congressional solution. The outcome is the worst of all possible outcomes, unending uncertainty. The lack of finality means that the principals and staffs must continue to expend energy investments or put on hold the combinations that cannot be made in adversarial relationships just go on. The erosion and respect for the competency in government is a great national law separate from the dollars and cent losses. We have found that within the State a very small percentage of cities that back up plans for water supplies are interrupted by drought, mechanical failure or contamination.

Wetland protection is under a maze of overlapping and conflicting authority and is producing grid lock. Basin plans in most basins is virtually nonexistent. In May of 1989, Secretary Lujan and I Chaired a meeting at the Interior Department with representatives of all Federal water agencies to discuss the problems. The White House was well represented. However, nothing has come of it. I am convinced that without strong support from the White House and Congress, support which requires all Federal agencies to enter serious dialogue, no effective leadership or change will result at the Federal level.

Despite that gloomy short term outlook I am very optimistic that there is much needed restructuring that is underway at the State level. The States are being called upon by the Western Governors

to provide the leadership from the bottom up, if you will. And we are going to be working with the Western States Water Council to put together a regional strategy in this regard.

Let me just quickly move to the recommendations regarding your bill, if I may continue, Senator. Some of my colleagues have suggested reviving the State and Federal interagency committees, not the river basin committees that were established by the Water Resources Council. Clearly there are a number of options. And in all your efforts in trying to straighten out what has become intolerable, I would suggest two changes. One, that the commission needs the support from an overarching authority. The Department of the Interior or another agency will not have the ability to control or direct on the part of other bureau agencies.

Congress, because of its diversity of committees involved, probably cannot fill the gap either; although, it clearly needs to be involved. The commission, with no commitment from the top, is unlikely to be sufficient. Our expertise thus far indicates there must be a strong link to the president of the White House. Secondly, States must be involved as well in true partnership arrangements. States have primary responsibility for water management and are in a position to effect many of the recommendations that would result. In addition, States, as a major customer, have information and feedback that Federal agencies need to hear if they are to undertake why and in what ways they need to change.

Your bill provides advisory input from special interest groups. States are not another special interest group, especially when it comes to water resource and management of the West. They are primary water managers and should be treated accordingly. The nations water system will benefit as a result. Thank you, Senator.

Senator HATFIELD. Thank you, Mr. Cunningham. First of all, I would like to express my appreciation for the white paper that Governor Senner handed out as the chairman of the committee and commend you on a very fine piece of work. And I would like to have you communicate, if you would, my expression of congratulations to Governor Senner.

In your pointing up of the role of what we call the bill, the commission—we would like to work with you on sharpening our intent and the wording of the bill to emphasize the fact that the so-called White House level group that we use as a term of art is really an independent body made up of a number of cabinet people at a membership level, not as a directive level so that we were hoping to homogenize all of those agencies in the Federal Government so no one would have a preeminent role. Now, that is the intent. I gather that is what you are suggesting as well. And there are ways that we can make that more clear, I think, in our bill.

Mr. CUNNINGHAM. Yes, that is our intent. We would be happy to work with you, Senator, on sharpening the wording on that and any other aspects of the bill that you would like to work with us.

Senator HATFIELD. Sure. And I also want to take notice of your point that this is ultimately going to have to be a very strong participating role by the States, by the Federal system itself and distinguishing the States' role as being vital, but also not in just as other groups have a legitimate interest, but to set the States apart

in their role because of State and Federal law and allocations and that precedent of law.

Obviously, when the Supreme Court ruled relating to the FERC authority in the California case, that set a lot of shudders through the western part of the country in terms of what appeared to be a challenge to "the precedent and the history and the tradition of water law and water allocation"". I would not be a bit surprised that in this whole process we may have to come to a little newer perspective on those inter-regional and Federal, State relationships not determined by our legislative proposal, but by determination of the courts in water law.

But nevertheless, we appreciate very much your contribution this morning. Thank you all, gentlemen, for being here.

I would like to now invite John Keys, regional director of the Bureau of Reclamation, General Pat Stevens, who is our division commander of the Army Corps of Engineers of the North Pacific division, Mr. Ron Kreizenbeck, chief of EPA, Region X, Office of Policy and Program Management, and Mr. Jim Jura, the administrator of the Bonneville Power Administration. Gentlemen, if you will take your places.

John Keys, do you want to lead off?

**STATEMENT OF JOHN W. KEYS III, REGIONAL DIRECTOR, BUREAU OF RECLAMATION, PACIFIC NORTHWEST REGION, DEPARTMENT OF THE INTERIOR**

Mr. KEYS. Good morning, Senator, I am John Keys, Pacific Northwest Regional Director for the Bureau of Reclamation with headquarters in Boise. Out of that office we administer water resources programs in Idaho, Washington, Oregon and a piece of Montana and Wyoming. I am certainly happy to be here today. I have submitted a statement for which I will proceed forth from.

My comments today are not intended to represent the administration's position on S. 1996, but are rather my own observations. Mr. Chairman, many of the objectives presented in S. 1996 are laudable. If properly addressed, they could provide a vehicle for more cohesive and understandable water policies in all of the 19 Western States and, indeed, the entire United States. It addresses certain aspects of water resource problems and programs administered by the Department of the Interior and other Federal agencies. For review of where these water resource programs stand and an analysis of how we could better serve the multitude of water resource interest, if properly scoped, would be of significant value to the water resource community in the Western United States.

As demands for water increase and are complicated by shortages and changing use considerations, the demand for sound, balanced resource management increases as well. A review such as that called for by this legislation could be an effective means of helping meet that demand. I would make one point however. As you know, western water law and the basic primacy of the States in water right issues play a major role in Federal water resource programs. It is essential that a review of Federal water policy reflect that inseparable State and Federal relationship.

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With that in mind it may be advantageous to strengthen the role of the States in the proposed commission of the subject legislation. In that vein, S. 1996 has been reviewed and discussed in detail by the Western States Water Council and the Western Governors Association. Their concerns and suggestions may help in the development of this review. There is a concern that we have with all of the activities underway in this region that another commission and its operation could complicate the issue. That concern, however, might be offset by a semblance of order put into that whole process. And we would certainly support that.

I might add at this time that we have and are experiencing in this region at this time probably the highest level of cooperation between Federal agencies that any of us in the water community have ever seen before. I think we have all been pulled together by the systems operation review that is underway in the basin and the Endangered Species Act petitions that have been filed. Our relationship in the Bureau of Reclamation with the Corps, Bonneville Power, the National Fisheries and the Fish and Wildlife Services is probably better than it has ever been before.

In summary, I support your concept of a group that would assess what is necessary to bring order to our changing, complex water and power situation in the Western U.S. We stand ready to help you in this effort. The Department of the Interior will provide official comments on the legislation at some later time. With that I would be happy to answer whatever questions you might have of the Bureau of Reclamation.

[The prepared statement of Mr. Keys follows:]

PREPARED STATEMENT OF JOHN W. KEYS III, REGIONAL DIRECTOR, BUREAU OF RECLAMATION, PACIFIC NORTHWEST REGION, DEPARTMENT OF THE INTERIOR

I am John Keys, Regional Director for the Bureau of Reclamation's Pacific Northwest Region. I appreciate the opportunity afforded today to meet with you and give you some observations on the proposed Western Water Policy Review Act, S. 1996.

As I understand S. 1996, the bill will provide for a comprehensive review by the Secretary of the Interior of western water resources problems and programs. The bill, among other objectives, would:

1. Require the Secretary of the Interior to undertake a comprehensive review and report to the President and Congress within 5 years.

2. Establish a 18-member advisory commission composed of 12 members from the principal water committees of Congress and six other persons not presently employed by the U.S. Government.

3. In addition to other assignments received from the Secretary, the Commission would study the following:

a. Review water problems in the 19 Western States and develop alternative ways to solve the problems.

b. Examine all current Federal water programs and recommend whether they should continue and if so, how they should be managed for the next 20 years (including possible consolidation of the current water resources management and development agencies).

c. Review the need for additional storage or other arrangements to augment existing water supplies.

d. Review institutional arrangements including river basin commissions and compacts, the Water Resources Council, municipal and irrigation districts, and the Bureau of Reclamation.

e. Review western water law.

f. Review all activities and authorities of agencies, including the Bureau of Reclamation, Geological Survey, Corps of Engineers, and the Federal Energy Regulatory Commission, whose programs involve western water.

I also understand that the Commission would invite the States and appropriate special interest groups to work closely with them, although there is no requirement that any of these groups be a member of the Commission.

I would make one point, however. As you know, western water law and the basic primacy of the States in water rights issues play a major role in Federal water resources programs. Thus, it is essential that any review of Federal water policies reflect that inseparable State/Federal relationship.

The Department of the Interior will be pleased to provide the Committee with its views on S. 1996. We have already begun the review process. Meanwhile, I will be happy to respond to any questions you may have.

Senator HATFIELD. Thank you, Mr. Keys. If you were to just sort of project into the future what would an analysis that you would offer as far as predicting the water supply versus the water need and the competing uses, the demand for instream and consumptive uses and so forth? What would you make on the base of your knowledge now as projected, say, 20 years down the road?

Mr. KEYS. Basically, Senator, if you consider all of the competing needs in the basin, what you are asking is when will we run out of available water. I would tell you that we are probably there now when you consider the timing of water resource needs in this part of the country.

Senator HATFIELD. Time lag?

Mr. KEYS. That is correct. If you look at an average—of course, average could be the difference between zero flow and a flood. And in an average, you would probably come out pretty well. But the timing of that water supply is all important. There are times during the year, in our basin, when we could use more water right now.

Senator HATFIELD. Would you give me an interpretation on the role that the Bureau played—I am going to ask the Corps the same—in the Carter administration when the last high level interest we had on western water rights and water supply and water projects and water management was a hit list on water projects in the West by President Carter? And the question is: Do you know, in terms of a national policy of that kind being enunciated by the President, whether that is driven by the input analysis of the agencies, managing the water supply or was it an OMB budget driven kind of statement and policy? Would you speculate on that if you do not know the actual facts?

Mr. KEYS. Senator.

Senator HATFIELD. Now, you have got a lot of leeway there.

Mr. KEYS. Senator, the answer could really put me on the hot spot, I am afraid, but let us venture in that anyway.

Senator HATFIELD. This is all off the record today, of course.

Mr. KEYS. But she is still typing, Senator. Senator, the hit list and that process, at that time, was certainly, I think, budget driven. We, in Reclamation, were put on the defensive in the worst degree by that activity because it singled out some of the programs that had been underway for a long time in Reclamation. Certainly there were some objectives, some policies that could have come out of that that would have been beneficial to all of the water resource agencies. But I think they were budget driven. I am afraid that the true consideration of water policy and the needs of individual projects was not considered at that time, the need to try to put a fiscal area into it just did not work.

Senator HATFIELD. You know, that has an interesting history and a hinge event in the political life of that administration. You will recall that was the first major policy President Carter enunciated following his inauguration, the same month of his inauguration. And the interesting thing is at that time, there was an immediate activation by the western senators, under the leadership of Paul Laxalt, a Republican, Dennis DeConcini, a Democrat. And it was a formation of the western Senate block, which had not been in existence for many years. And it was also a time when people like Senator Jackson, Democrat from Washington State, and others from the party of the President, took, if anything, a more distinctive political counteraction to the President than even the Republicans. And from that point onward, I think, President Carter continued to suffer erosion of political support within the Congress of a major segment of his own party. I do not think it ever really came to him what an impact that was having. Because when we met in that first western Senators block meeting under the co-chairmanship, people like Senator McGovern had joined us from up in the Dakotas and others said, "We want to be part of this Western State action to counter this kind of policy that has so little comprehension of Western needs."

Now, that also elicited out of this a very interesting review that I have used many times in my State here of making reports about policies governing resources. When I went to the Senate, the old Interior Committee that preceded the Energy and Natural Resources Committee, there was not a Democrat, there was not a Republican from the Western public lands. Today the chairman of that committee is from Louisiana, hardly a western public lands State. But we are very fortunate in having Senator Bennett Johnston chairing this committee that has the authorizing legislation. Because I know few people on that committee who have a greater knowledge and greater interest in western resource programs and western policies than Senator Johnston. But we are fortunate. I could think of some other members of that same committee that I would not name that I would shudder to think having the authority of the chairmanship of that committee as it relates to western public land problems. But as I say, we are very fortunate to have Senator Johnston heading that committee.

But all of this merely—I am getting back to the point—has been the increasing frustration of the Congress working with the President has been the President's holding these budgets up there to the Hill. And oftentimes resource management policies are driven more by the Office of Management and Budget than by the agencies with the expertise to counsel the President. And, boy, we just battle that on every front, not just water, but everything else. And I do not care whether Democrat or Republican president, does not make that much difference. Mr. Carter just epitomized the whole thing by what his action was on the hit list. But we have had, frankly, from California, a Republican Governor that should have known better for some of the things that he recommended up there about western public land policies coming from a Western State. Everything else we always got the example, "When we were in California, we did it this way." Well, I wish we had done a few more things like they did in California as it relates to western poli-

cies and natural resources. Because, again, OMB was driving the policy from the sale of Bonneville Power Administration to the current administration wanting to change the repayment schedule. That is obviously driven by Office of Management and Budget. And that is not going to solve our water policies any more than it is going to solve our timber policies or any of the other type of things. Would you agree, Mr. Keys, on that statement?

Mr. KEYS. I was going to ask which part of it, sir.

Senator HATFIELD. Let the record show he did not respond.

Mr. KEYS. The policy review that was carried on by the Carter administration came at a bad time for the Bureau of Reclamation. We had just gone through the traumatic events and the failure of Teton Dam. We had been faced with a lot of the actions brought on by compliance with NEPA. National Environmental Policy Act is probably one of the best things that ever happened to our country, but it did cause lots of changes in the water policy planning that we had done. The one good result out of that whole activity, I think, is that it directed our attention to a lot of areas that we had not thought about before. And certainly that was a positive. I think one of the negatives is that we did get away from a true regional evaluation of the need for water projects and it became a national evaluation in which dollars played probably a more important part than it should have done at times.

Senator HATFIELD. We could use you in the State Department.

General Stevens.

## STATEMENT OF BRIG. GEN. PAT M. STEVENS IV, DIVISION COMMANDER, ARMY CORPS OF ENGINEERS, NORTH PACIFIC DIVISION, DEPARTMENT OF THE ARMY

General STEVENS. Thank you very much, Senator Hatfield. I am delighted to be here this morning. Sir, I have a statement that I will submit for the record, with your permission, that summarizes my remarks. I welcome this opportunity to represent the Department of the Army at this field hearing. The Corps of Engineers has had a long-standing role in the development and regulation of this Nation's and specifically this region's water resources.

Before I comment specifically on the bill, I want to take the opportunity to put our comments into context. In your letter of invitation, you noted that the institutional framework surrounding Federal water policy is complex and has often resulted in conflicting and overlapping goals. In your floor statement, when you introduced the bill, in describing interagency complexity and conflicting goals, you used one example, the Environmental Protection Agency and the Army Corps of Engineers. We agree with you fully that water policy framework is complex and historically, at times, agencies have worked at cross purposes. This, in our view, does not serve the public well. However, we believe that vast improvements have been made in recent years. These improvements would not have come about without the encouragement and constructive criticism of you and other senators who have made improvement of our Nation's water resources a high priority. I would like to describe a few of those as background to our general comments on the bill.

First, with respect to EPA and the Army Corps of Engineers relationships in the section 404 regulatory program, within the past year EPA and the Army have signed memoranda of agreement resolving three of the most contentious longstanding issues between the agencies. These are MOA's now in effect on determinations of geographic jurisdiction, enforcement procedures, and mitigation. We believe that the current cooperative interagency attitude will go a long way in simplifying the program and making it more understandable and acceptable to the public.

I would like to add that here in the Northwest, we are pleased with this new standard of interagency coordination and believe it is working well. Our relationships with EPA and the other Federal agencies are at an all time high. For example, the Corps of Engineers, Bonneville Power Administration, and the Bureau of Reclamation have reached an agreement to jointly undertake a comprehensive review of the Columbia basin system. This effort will include coordination with the Northwest Power Planning Council, the Northwest States, Indian tribes, interest groups and the general public at large. As part of this process, the interagency team of the Corps, the Bureau and BPA have completed 14 public meetings this month to gather ideas on the scope of the review.

It is with this background in mind, Senator, that I offer, on behalf of the Department of the Army, the following general observations on S. 1996. The bill would require the Secretary of the Interior to review and make recommendations on the Federal water resources activities in the Western States. It would also establish an advisory commission to assist the secretary.

We certainly support the need for continued improvement in the management of our Nation's water resources. We believe we have made significant strides in the past few years. The opportunity to demonstrate continued improvement pursued with your help and in coordination with this subcommittee, should make establishment of a commission and a 5-year period for a substantive report a matter of less urgency.

I cannot comment further on the bill at this time because the Department of the Army has not completed its review of the proposal. We will get back to you, Senator, with specific comments as soon as that review is completed. Thank you very much, Senator Hatfield.

[The prepared statement of General Stevens follows:]

PREPARED STATEMENT OF BRIG. GEN. PAT M. STEVENS IV, DIVISION COMMANDER, ARMY CORPS OF ENGINEERS, NORTH PACIFIC DIVISION, DEPARTMENT OF THE ARMY

I welcome this opportunity to represent the Department of the Army at this field hearing. The Corps of Engineers has had a long-standing role in the development and regulation of this Nation's and specifically this region's water resources.

For example, the Columbia River Basin is the third largest in the continental United States with a drainage of 259,000 square miles, including portions of five States and Canada. The Columbia River flows a distance of 1,200 miles from British Columbia, Canada, to the Pacific Ocean, dropping in elevation about 2,600 feet on its journey.

There are over 200 water control projects in the Columbia River Basin. These projects are managed to varying degrees by a multitude of State, and Federal agencies and private, public groups. Canada also plays a significant role. Nineteen of these projects are mainstem dams on the Columbia and its major tributary, the Snake River. The eight lower-most projects are multipurpose reservoirs operated by the Army Corps of Engineers, North Pacific Division, for flood control, navigation, hydroelectric power, recreation, and fish and wildlife conservation. The Division

headquarters is located in Portland, Oregon, and the four district offices are located in Portland, Oregon; Seattle, Washington; Walla Walla, Washington; and Anchorage, Alaska.

Additionally, the Corps has a major regional role as a regulatory agency through its Federal responsibility on the waters of the United States. This regulatory mission is accomplished in concert with the Environmental Protection Agency.

Before I comment specifically on the bill, I want to take the opportunity to put our comments into context. In your letter of invitation you noted that the institutional framework surrounding Federal water policy is complex and has often resulted in conflicting and overlapping goals and strategies in dealing with water policy. In your floor statement when you introduced the bill, in describing interagency complexity and conflicting goals, you used as one example the Environmental Protection Agency and the Army Corps of Engineers. We agree with you fully that the water policy framework is complex and historically at times agencies have worked at cross purposes. This, in our view, does not serve the public well. However, we believe that vast improvements have been made in recent years in interagency coordination. These improvements would not have come about without the encouragement and constructive criticism of you and other Senators who have made improvement of our Nation's water resources a high priority. I would like to describe a few of those as background to our specific comments on the bill.

First, with respect to EPA and Army Corps of Engineers relationships in the Section 404 regulatory program, within the past year EPA and Army have signed Memoranda of Agreement (MOA) resolving three of the most contentious longstanding issues between the agencies. These are MOAs now in effect on determinations of geographic jurisdiction and implementation of the Section 404(f) farming exemptions, enforcement procedures, and mitigation. There is also a joint manual on technical methods to identify wetlands. We have come a long way in a short period of time, and we believe that the current cooperative interagency attitude will go a long way to simplifying the program and making it more understandable and acceptable to the public, including those who are regulated.

I would like to add that here in the Northwest we are pleased with this new standard of interagency coordination and believe it is working well here. Our relationships with EPA and the other Federal agencies are at an all time high. For example, the Corps of Engineers, Bonneville Power Administration (BPA), and the Bureau of Reclamation have reached agreement to jointly undertake a comprehensive review of the operation of the multipurpose Columbia River Basin projects. That review will examine and evaluate alternative system operating scenarios in an effort to identify system operations aimed at balancing the many needs, uses, and demands placed upon the water resources of the Columbia River Basin. This effort will include coordination with State agencies, other Federal agencies, the Northwest Power Planning Council, fish and wildlife agencies, Northwest States, Indian Tribes, interest groups and the general public. As part of this process the interagency team of the Corps, Bureau and BPA held 14 public meetings this month to gather ideas on the scope of the system operation review.

In the area of Federal water projects, we also have similar good news. Several years ago, Assistant Secretary of the Army for Civil Works, Robert W. Page asked the Corps to expedite the process for developing Corps water resources projects. You know only too well that historically it took up to 20 or 25 years from the time project planning began until construction started. We analyzed the process and made several significant changes, one of which is directly relevant to the subject under discussion today. We have adopted a procedure which includes a Feasibility Review Conference. This conference takes place after a plan is reasonably well developed but before the district engineer finishes his report and makes recommendations. When we adopted this conference procedure, participants initially included the Corps district, division, and headquarters, the Assistant Secretary's office, and the non-Federal project sponsor.

The objective of the conference is to ensure that all pertinent issues are raised and that resolution of disagreements is reached, or failing that, a mechanism is set in motion to resolve any disagreements prior to the district engineer issuing a final report. In that way, we accomplish two important goals. First, we provide assurance to the non-Federal project sponsor that once the report is issued, all levels of the organization will be able to support the proposal. Alternatively, if support is not possible, the sponsor is not strung along through various levels of sequential review which historically took 3 to 4 years to complete. Second, we reduced drastically the time required for higher level review. As I just noted, historically, the higher level sequential review process took 3 to 4 years. We are now able to complete the review in less than one year, because expert staff at all levels of the organization will have

been involved concurrently in the review and will have concurred in the content of the report prior to its being published.

After following this process for about 18 months, we and the project sponsors were very pleased with results, but one important feature was missing. There were, on occasion, issues unresolved with other Federal agencies. So we have recently begun including interested agencies in the Feasibility Review Conferences. While it is too soon to assess the results, there are some positive signs that issues are being raised earlier in the process and are being dealt with in a expeditious, constructive manner. Reaction to date from the agencies is encouraging. For example, in one recent meeting in our neighboring division to the south, the Regional Commissioner of the Bureau of Reclamation personally participated in a project review where we were successful in our joint goal to make sure that responsibilities and authorities of both agencies work together to the best public benefit.

The point of this discussion is to show that we have read the intent of Congress expressed in the Water Resources Development Act of 1986 which established Federal/non-Federal project partnerships, set timetables for studies, and generally put the water resources development program back on track after many years of foundering. We appreciate and acknowledge your leadership in forging this 1986 Act and in conducting this hearing. Sometimes the agencies need some help and encouragement to make the system work better, and you are providing that.

It is with this background in mind that I will offer on behalf of the Department of the Army the following general observations on S. 1996. The bill would require the Secretary of the Interior to review and make recommendations on Federal water resources activities in the western States. It would also establish an Advisory Commission to assist the Secretary.

We certainly support the need for continued improvement in management of the Nation's water resources. We believe we have made significant strides in the past few years and the climate is excellent for continued improvement. The opportunity to demonstrate continued improvement pursued with your help and in coordination with this subcommittee, should make establishment of a commission and a 5-year period for a substantive report a matter of less urgency.

I cannot comment further on the bill at this time, because the Department of the Army has not completed its review of the proposal. We will get back to you with specific comments, as soon as that review is completed.

Mr. Chairman, that concludes my testimony. I would be pleased to address any questions that you may have.

Senator HATFIELD. Thank you very much, General. The last few years we have been trying to deal with this drought situation and the Corps has played a very important role in that. And as you know, we have legislated some changes in process and so forth. But the question I would like to put to you today is that because of the enormous impact it has had on every usage, whether it is irrigation, power production, fisheries and so forth, the drought to which I will refer, we have asked you—the Congress has asked you, as the Corps, to make these studies in relation to and in conjunction with the intergovernmental council, the decision making structure for drought management. With your experience, how do you regard this coordination of drought management in the Pacific Northwest? Is it a stopgap measure? Is it something that could be improved?

General STEVENS. Senator, I would start off by commenting that it could certainly be improved in my view. The Corps is, as you suggested, looking at a review of policies and procedures about our management of drought. In our management of drought reaction, we are reactionary, I think, more than we should be. This is perhaps because we have a great deal of difficulty in predicting the degree of a drought. So we manage the system based on our assumptions of historical patterns and trends. We obviously work through that framework on the chart over there. And it is enormously complex in our efforts to do that. That is about all I could offer you, Senator Hatfield. Water is a given resource of a certain

quantity. When it does not come down out of the sky, we manage that situation as best we can. And I would like to endorse what Mr. John Keys said, that our system in this basin, the Columbia basin, is currently fully and completely utilized and it is a system under stress.

Senator HATFIELD. So your projection of the future is that we are already at that point in terms of our exhausting the supply in relation to the demand?

General STEVENS. Yes, Senator, I would say we are.

Senator HATFIELD. General, is there any way to be less reactive to such emergencies as drought and be able to be less victimized by forces than what we are today?

General STEVENS. I think there is, Senator. And that, of course, is what our headquarters and the Chief of Engineers Office together with the Army is looking at, recommending a procedure to do that. And obviously they are working with our friends in the Bureau of Reclamation and many of the others in coming up with something. But essentially it will always hinge on the degree of our ability to predict weather.

Senator HATFIELD. Thank you very much.

Mr. Kreizenbeck.

## STATEMENT OF RONALD KREIZENBECK, CHIEF, REGION X, OFFICE OF POLICY AND PROGRAM MANAGEMENT, ENVIRONMENTAL PROTECTION AGENCY

Mr. KREIZENBECK. Thank you, Senator. My name is Ron Kreizenbeck. And I am the director of the EPA, Region X, Office of Policy and Program Management. And I want to thank you for the opportunity to testify here today.

I offer the following observations and suggestions in response to the questions you have raised in your letter to us. The first question is, how are current institutional arrangements affecting the prudent management of our water resources and are there sufficient grounds to suggest that alteration of those arrangements is warranted. I think we, in EPA, view that water quantity and water quality are inextricably linked. Contaminated water, whether by pesticides, bacteria, salt, et cetera is unusable by anyone. Secondly, the West's fisheries and recreational resources are dependent upon adequate supplies of high quality water. Our Western States, in their section 305(b) reports typically report that over 60 percent of their water quality problems are linked to water use issues, those being irrigation return flows, damage of riparian flows, et cetera.

Responsibilities for managing the Nation's water resources and; hence, responsibilities for resolving these issues are fragmented among many Federal and State agencies as is demonstrated by the chart here. In addition, tribal authorities are also playing an expanding role. Unfortunately, these agencies are often working under conflicting mandates. These conflicts make it very difficult to develop equitable solutions that serve the long-term interests of the nation. Also such conflicts are increasing both in number and complexity as our society's demands for better environmental protection increase.

The second question was what is the best way to proceed in looking at alternative arrangements. And I am afraid I will have to say that I do not have any mystical insights into the answer to that very difficult question. However, I think it is important to say that the conflicts raised basically center around water quantity versus quality issues. And many of the other Federal agencies, including Fish and Wildlife Service, Corps of Engineers and Bonneville Power share water quality or resource responsibility with EPA. And for that reason I suggest that the proposed legislation provide a strong mechanism for such agencies' views to be heard.

Also it has been my experience that water quality resource coordination is most effective when it has a problem solving focus. In the West, the water basins often face dramatically different problems. We just heard at length about the Columbia. The Columbia basin with the salmon resource is a classic example. With that in mind I would suggest that the legislation also provide for geographic or watershed focus for the policy review and coordination.

In closing, I want to stress that EPA sees great opportunities for win-win solutions to the water resource problems confronting the West today. For example, proper riparian zone management can increase base flows and reduce erosion, while at the same time providing improved fishery protection. And water conservation measures preserve water for other uses as well. Thank you for the opportunity to testify this morning.

Senator HATFIELD. Mr. Kreizenbeck, unlike the other folks who have testified at the Federal level and will testify, your role here has been primarily set up by law to be regulatory rather than management—the focus, I should say. Is it possible to delineate between when regulation becomes management and the conflicts it may even superimpose upon what we have already seen as a complex administrative chart?

Mr. KREIZENBECK. I think that is certainly in the eye of the beholder, when we are regulating something or, as I said, pursuing one of the mandates that we feel we have under the Clean Water Act. I think that clearly, in the eyes of some, we are crossing that boundary from regulatory into management. I notice on the chart that we have lots of dotted lines going from EPA to the other resources. I am not sure exactly what those mean, but I think that maybe that is part of the problem, that it does fuzz out in that arena.

Senator HATFIELD. I gather, too, from your statement, that unlike the gentlemen to your left at the Corps and the Bureau of Reclamation, you do not see the kind of interagency cooperation that their tone of testimony communicates to me. Yours is more of growing conflict within the agencies is how your tone of testimony comes through to me.

Mr. KREIZENBECK. I apologize for that. There are not growing conflicts as far as the other Federal agencies are concerned. What I was trying to say is that there are growing conflicts in general. I would certainly echo what——

Senator HATFIELD. More at the competitor's use and user group?

Mr. KREIZENBECK. Yes, yes. And more and more users are out there. We have certainly experienced a lot of growth in the Northwest.

Senator HATFIELD. You and the Corps—your agency signed a memorandum of agreement recently on the matter of the wetlands and established this new legislation policy. Would you care to make any comments as to your regulatory activities surrounding the wetland issue and that impact of the wetlands issue on the existing water policies or water users or water problems?

Mr. KREIZENBECK. Well, I think that as General Stevens said, that the memorandum of agreement was a good step forward on both agencies' part. And I think we outlined for everyone exactly how we were going to proceed together. And, I think, unfortunately, in the views of a lot of the public, we did not communicate that real well, exactly what that memorandum of agreement entailed. But essentially it is just saying this is how we are going to do business. In fact, clarified how we are doing business. And, I think, it has been successful. It was not necessarily viewed that way in all corners and, I think, it was because we did not communicate very well.

Senator HATFIELD. But you are addressing in that memorandum process rather than projecting as to the impact of wetlands and to the existing water supply, as I understand it. You are dealing more at process at this point?

Mr. KREIZENBECK. Yes.

Senator HATFIELD. Have you had enough data base in your own agency before or have you been gathering such to make any comment about the impact of wetlands upon the water supply and water use policy?

Mr. KREIZENBECK. Well, clearly, if left to strict protection of wetlands, we would certainly increase both the quality and the quantity of the water resource throughout the Northwest. However, that is a very difficult job to do, as I am sure General Stevens would tell you also. So the wetlands program can certainly be helped in that regard, but we do not have the data base yet to——

Senator HATFIELD. No. And you really do not have parameters that are clearly defined, from my perspective, especially after the president's executive order—and quoting him in that order, "no net loss"? Is that project by project? Area by area? State by State? Region by region? Nationally?

Mr. KREIZENBECK. Well, as you may know, sir, the Domestic Policy Council is grappling with that very subject right now and there will be hearings in Olympia on September 5, I believe, and in Anchorage the 6th or 7th dealing with that very difficult subject. And you are right, we do not have a concise answer.

Senator HATFIELD. I know it is premature to ask you to comment any further on process because of lack of data base. And, of course, I had indicated I just came back from a trip around the eastern part and the coastal area of this State and other areas. And particularly out of the agricultural community, there are a lot of questions about how the effect will be on existing agricultural operations as it relates to the wetlands issue and anxiety in some cases, concerns.

General, do you wish to comment any further on this wetlands in relation with the EPA?

General STEVENS. Senator, I would really back up what he said. It was the view of the Army and Environmental Protection Agency

that that very controversial memorandum was only an attempt to explain to the public the agreed upon process that we would go through. It obviously, as its history testifies, did not come across that way and there has been considerable concern about it. Based on that, the Domestic Policy Council is currently reviewing it and, I am sure, will provide some guidance at the end of that. But I would say, on the side of the Army Corps of Engineers, that we saw the memorandum simply as an explanation of the process that, hopefully, we had in place nationwide already.

Senator HATFIELD. I appreciate that. And, of course, we have unique situations in small areas that I hope that those national guidelines are flexible enough to adapt to those locals. I think, for instance, General Stevens, Mr. Kreizenbeck, in effect, under circumstances of dredging the Columbia River for the maintenance of the channel, could be in a position to create more wetlands by the use of the spoils in the lands that are adjacent to the Columbia. But, of course, that alters environmental situations and there may be other priorities than to create more wetlands that have to be considered. I am not suggesting, at this point in time, that that is an automatic type of thing to happen. But I am sure that the choice working relationship of the Corps, in that particular issue, is more important with your agency. Because if wetlands represent a certain high priority and you can create more wetlands and at the same time you have a way to dispose of spoils, that might be a complimentary kind of action rather than a competitive kind of action. But it would have to certainly be with the EPA's general involvement to make those analyses as to how it alters that particular adjacent land to the Columbia. There may be other environmental values to consider other than wetlands is what I am saying.

Mr. KREIZENBECK. Certainly. And what I hope that all of our comments today have been in the vein that we are open to whatever those suggestions are.

Senator HATFIELD. Thank you.

Mr. Jura.

## STATEMENT OF JAMES J. JURA, ADMINISTRATOR, BONNEVILLE POWER ADMINISTRATION, DEPARTMENT OF ENERGY

Mr. JURA. Thank you, Senator. I would like to, thank you, again, for providing the leadership and foresight to address this critical issue of water policy. From BPA's perspective, this legislation addresses two critical issues. First, coordination of various agency efforts, and, second, encouragement of the conservation of our precious water resource.

We would like to take note of some of our activities in these areas while we recognize they are only small pieces of the larger puzzle this legislation addresses.

As you well know, water is the treasure which provides the foundation of the Pacific Northwest's economy, and we refer to the Columbia River as the crown jewel. The citizens of the Pacific Northwest enjoy the fruits of the foresight and the initiative of the strong political leadership earlier in this century which recognized the tremendous benefits that could be gained by harnessing the strength of the Columbia River. And certainly, the Pacific North-

west has benefited from your efforts, Senator Hatfield, to protect, preserve, and enhance the Columbia River system.

However, we see, as you do, increasing conflicts over the uses of water, particularly in the Columbia River Basin. The river system has been designed to encourage widespread use. And in this regard, we have been enormously successful. The Columbia River provides irrigation water for farms, navigation for commerce, low cost electric power for the region, commercial and sport fishing, as well as recreational benefits.

Over the years, as these needs and uses have increased, competing demands have been placed on the river system. The Bonneville Power Administration, Bureau of Reclamation, and the Corps of Engineers are attempting to address this problem through the Systems Operation Review described earlier. We hope this process will result in a regional consensus on the broad policy objectives for which these agencies are responsible. In addition, we hope to improve the coordination and cooperation between our agencies. But, we do recognize that this effort is only a small part of the broad picture that you are presenting through your legislation.

Senator, I would also like to take note of the tremendous success that we have had in this region through electric energy conservation programs as a result the Pacific Northwest Electric Power Planning and Conservation Act, which you sponsored. And, I would like to thank you for your personal interest and your commitment to assuring that our region captures the significant opportunities that we have in this very important conservation resource. Senator, you have pushed us pretty hard in recent years to go after these opportunities. And in those years when we had a surplus, there were times when we may have questioned whether or not it was prudent to go after it that fast. But now that we are in low resource balance, we are very pleased that you were putting that pressure on us. So these actions and especially our conservation activities are, I think, what will allow us to preserve the benefits of our low cost electric power for future generations. So we applaud your initiative to address this issue. But we have only recently received a copy of the bill and consequently have no formal position to take on it at this time. I would like to thank you for involving us in the process and we look forward to working with you and your staff on it.

[The prepared statement of Mr. Jura follows:]

PREPARED STATEMENT OF JAMES J. JURA, ADMINISTRATOR, BONNEVILLE POWER ADMINISTRATION, DEPARTMENT OF ENERGY

Thank you very much for the opportunity to appear before you today.

I want to thank you Senator for showing the foresight and leadership to address this critical issue. As you well know, the Pacific Northwest has struggled with the competing uses of our valuable water resources. Bonneville Power Administration has only recently received a copy of the bill and consequently has no comments to offer at this time. We look forward to working with you Senator and your staff.

I want to thank you for involving us early in this process. We look forward to working with you in the future.

Senator HATFIELD. Thank you. Mr. Jura, would you briefly describe the Yakima basin plan as it relates to the agenda that has been initiated by the BPA and how that is working out with the other players in that plan such as the Forest Service, the U.S. Fish

and Wildlife, the EIA and the Bureau of Reclamation? Just sort of update me on that project as to whether it is an illustration of the complexities of these interrelationships or whether that can be a project that rises above all these complexities and achieves a certain goal.

Mr. JURA. Well, I think this particular project may be a good example, Senator. The program in the Yakima River Basin is part of the Regional Council's program. It has been designed by all entities in the region coming together and trying to decide what is best to enhance and protect our fishery resource. The Council's Plan calls for a long series of actions to be taken in the Yakima Basin that were started a number of years ago. They include many activities including screening mechanisms at the irrigation devices, and a very aggressive hatchery program. We have already had significant success, but we are now seeing some of these conflicts. For example, I mentioned an aggressive hatchery effort is in the planning stage. We are seeing some challenge to that project by certain groups who are claiming that this will conflict with other interests. It might conflict with the trout population, or may have an adverse impact on native species, the wild stocks.

There is no question that this river basin is a good example of the competing uses because of the heavy irrigation involved there. It includes many of the things that have been mentioned already. We can direct our efforts to make improvements in these fish stocks, specifically habitat improvements, as well as these other measures I have mentioned. So, we are well on our way through it. These different interests are represented through this process. It is a good example of where the conflicts are obvious.

Senator HATFIELD. Do any of you gentlemen wish to comment on that project?

Mr. KEYS. Yes, sir. The Bureau of Reclamation is, of course, a close partner with Bonneville Power in that project. There are times when that cooperation has pushed us to produce an excellent product. There are also times when it has confounded the process of getting there. The progress to date has been good. How we take it from here is the crux of the question. And that is the difficult part. We have, as Mr. Jura said, installed the ladders and screens and we have provisions now for the fish to get back up there. Now, we need to take it a step further. In other words, to provide more water for them to get there with and to test the hatchery production of wild stocks. This is the one test throughout the western United States that tells us whether we can enhance wild stocks with hatchery production and that is the challenge there. But certainly there is a complicated maze to get through to get there.

Senator HATFIELD. Let me turn to another project that, Mr. Conway, we have had an update, I am sure you have probably heard about already. We have had a petition on the part of a number of local interests here and the Indian nations on a potential listing of five salmon species as an endangered species, the wilds, not the hatchery, the wild that use the Columbia as part of their cycle. And rather than waiting till it got to a national polarized issue like the Spotted Owl, vis-a-vis the forestry, I convened a session of the Federal agencies, the private user groups, the State agencies and so forth to try to reach a process by which we could

have what I call a predecisional determination based upon signs, all the other efforts for a potential recovery of that, if that is what the signs leads us to rather than to wait for the whole endangered species to play out.

Now, that is on a parallel track. We are not in any way trying to sidetrack the endangered species process. But nevertheless, to undertake a local, regional process by which we could perhaps make the issue, by the time the endangered species program is finished and assuming, certainly, that there would be a listing to trigger that next 18 to 24 months of endangered species process. Now, out of this has come a proposal by this ad hoc group that we convened in June to develop a 21-agency council under the aegis and support of the Northwest Power Planning Act and which includes the Indian nations and it includes the Federal agencies. And now the governor of Oregon, the governor of Washington, the governor of Idaho and the governor of Montana have become an integral part of this whole regional initiative.

Mr. Jura, as the Director of Bonneville Power, of course, has a very major part as well as the other agencies at the Federal level. But, Mr. Jura, based upon that, can you give us any update from the last meeting that we had? We had now the first meeting, the convening session, and now we have had the second one as a report back and the process presented and now the process being put together for implementation. Can you give us any update as it relates? Because here we are talking about not a Yakima project precisely, but another example of how we can bring all these conflicting groups together, perhaps maybe even make sense within that handicap.

Mr. JURA. Well, let me say that I think that the main advantage thus far—and it is a very significant one—is that you have managed to get the right people around the table at the right time; you have placed upon us a challenging assignment to get these issues out, to identify the issues that are contributing to the declines in these runs, and ask the basic question—what can we do to address these issues immediately. And, the pressure you have placed on this group, is a very positive development. General Stevens and Mr. Keys mentioned earlier how well we are working together, part of that cooperation is a result of this process. We have brought our agencies together to address these issues in a way that we had not done before. So, I think there is significant benefit in each of these parties coming to the table to address these important issues.

As to the status since the meeting, Senator, it is my understanding that we are getting close to selecting an outside facilitator to facilitate this process. The other organizations that I have talked with, are doing the same thing we are doing. They are starting to identify specific actions, the benefits of those actions, as well as the costs of those actions, so that we can come to the table, get the issues on the table, and take appropriate action. As we said in our earlier discussion on this issue, the work that has been done thus far is primarily associated with process, which I think is excellent. The hard work will begin once we get to the table, and start to discuss possible actions and costs and benefits.

Mr. CONWAY. Mr. Jura, I just want to follow up on that a little bit. With reference to the hard work part, would you care to specu-

late as to the chances of coming forward with some sort of consensus resolution that would, in fact, perhaps make unnecessary the whole endangered species process or at least a forced resolution under that process?

Mr. JURA. Well, first of all, it is my belief at this time there will be actions that will result from this predecisional effort to benefit the stocks. Now, that is a plus no matter what happens on the path we are going down with the Endangered Species Act potential listing. Mr. Schmitten advised me, in the last week, that he is soon expecting a formal legal opinion as to what the impact can be of this effort on his decision making, and he will be announcing that soon. We will have to see what that says. And, if there is some direct contribution this effort can make to his decision, we are that much ahead. But, I think, the fact that we will be accelerating our efforts to help the stocks as a result of this effort is very positive.

Mr. CONWAY. Senator Hatfield, I want to compliment you for organizing and having that sort of forethought to think of these processes. I think it was Dr. Warkentin, in his testimony, that said the thing in the water area as a whole we have to remember is we need to think more in terms of we rather than always they. And it seems to me that this sort of process gets away from the increasingly litigious world that we seem to have arrived at.

Senator HATFIELD. Well, we always are going to pursue these things with great hope and expectation. We have no guarantee that it will work. Nevertheless, I do feel that the agencies most directly involved at the local scene have expertise to bring to bear on anything like the endangered species. And I think we have a responsibility, in our normal missions, to deal with that rather than waiting for some kind of a pressure or leverage from a Federal agency or Federal law, the headquarters of your own agencies or the Federal action of the Government. I just cannot help but feel, as Mr. Conway says, we are ahead of the game, Mr. Jura. But we are also upholding what should be our generic responsibilities, as much our mission here as it is at the Federal level. In fact, it is more our mission here at the local level, it seems to me, because we are on a daily relationship to these various and sundry competing uses, adjudicating the differences as well as to make certain that the Endangered Species Act and all other legislation is being observed and implemented. I want to commend all of you for your testimony. Thank you very much.

Now, I would like to welcome the last four witnesses, Bruce Lovelin, executive director of Northwest Irrigation Utilities, Jerry Muys, attorney with the firm Will & Muys representing the National Hydropower Association, Kathryn Brigham of the Confederated Tribes of the Umatilla Reservation and Liz Frenkel, representing the Sierra Club, Oregon Chapter.

I would also suggest that we take a break at this point, because our court reporter, Ms. Vicki Nielson, is only human.

[Recess taken.]

Senator HATFIELD. Mr. Bruce Lovelin.

## STATEMENT OF BRUCE LOVELIN, EXECUTIVE DIRECTOR, NORTHWEST IRRIGATION UTILITIES

Mr. LOVELIN. Thank you, Senator. For the record, my name is Bruce Lovelin. I am the executive director of the Northwest Irrigation Utilities. Senator Hatfield, on behalf of the Northwest Irrigation Utilities, I want to express appreciation for your longstanding interest in water resources policy, planning and development. We commend you for you your vision in identifying water as a crucial resource issue of the future.

We also appreciate your sensitivity to both environmental and economic concerns. As you know, in the Northwest, the Columbia River water resources are the economic lifeblood of our region. Our region seeks a balance among these competing demands for the Columbia River water. And there are many trade-offs. For example, the proposed listing of salmon as an endangered species in the Columbia River System Operation Review require that we balance environmental concerns with economic values. We appreciate that you and others in the Northwest congressional delegation have an understanding of the economic values at stake as well as the legitimate environmental concerns.

NIU is an association of 29 consumer-owned utilities from Eastern Washington, Oregon and Idaho that represent the interests of irrigation. Agriculture is the base of our economy and without it and without irrigation our communities will not survive. Thus we are vitally concerned with the subject matter of S. 1996. S. 1996 is similar in scope and purpose to the National Water Commission established by act of Congress in 1968. The commission envisioned on your bill would be charged with studying many of the issues covered in the National Water Commission's 1973 report.

Certainly a great deal has happened in the area of water policy since 1973 and the pace of change is accelerating fast. Earlier I mentioned the endangered species petitions for salmon being considered by the National Marine Fisheries Service and the System Operation Review of the Columbia River being performed by Bonneville, the Corps and the Bureau of Reclamation. These are only the most dramatic and obvious examples of potential changes in water use and policy within the Pacific Northwest.

Environmental regulations at the Federal and State level in the Northwest include proposals for water conservation standards, protection of groundwater quality, protection of wetlands and others. These are either working their way through State legislatures or regulatory agencies or already adopted. And the Northwest certainly is not unique.

The point is that there are changing concepts of the beneficial use of water. There is a growing concern about environmental problems related to water supply. And these changes have brought about changes in policy and regulatory structure in a piecemeal fashion.

From the perspective of a water user group, it seems clear that the forces behind these changes do not seem likely to abate. They are likely to become more urgent and the conflicts more intense. We are concerned about the lack of certainty in the increasingly complex, if not confusing policies. The people we represent are de-

pendent on the livelihood of the Columbia River. And there are enormous economic consequences to their decision.

Because the changes are not likely to stop, we feel that we must be involved in the decision making process to assure that the rights of water users are considered and protected and the economic trade-offs are properly evaluated. And we have a huge economic stake in water policy decision and we cannot ignore these changes or simply oppose them. We must participate and seek constructive and practical solutions to the competing demands on the resource.

We endorse your bill, S. 1996, as a means of studying and identifying the changes which are going on in water resource policy, identifying means or better reconciling and coordinating competitive demands and examining institutional issues at the State and Federal level.

If such a commission is established, it will be critical that a balanced cross-section of views and interests is represented, including irrigated agriculture. The credibility of the commission will depend on the balance and fairness and professionalism.

In sum, water is the economic lifeblood of our region. We are in a period of increasing competition for water resources and increasing regulatory requirements on usage. Concepts of beneficial use are evolving. Agricultural users have much at stake and cannot ignore these issues or flatly oppose change. We must participate and attempt to shape change. We must suggest constructive alternatives. And I believe your bill, S. 1996, has a valid purpose. While we are not dissatisfied with the existing institutional arrangements, there may be room for improvement and study of this issue would be helpful.

We support your bill and we hope that you will feel free to call on us as needed as the legislation proceeds.

[The prepared statement of Mr. Lovelin follows:]

PREPARED STATEMENT OF BRUCE LOVELIN, EXECUTIVE DIRECTOR, NORTHWEST IRRIGATION UTILITIES

On behalf of Northwest Irrigation Utilities ("NIU"), I want to express appreciation to Senator Hatfield for your long-standing interest in water resource policy, planning and development. Water is a national issue, not just a western or northwest problem, and we commend you for your vision in identifying water as a crucial resource issue of the future.

We also appreciate your sensitivity to both environmental and economic concerns. As you know, in the northwest, the Columbia river water resources are the economic life blood of the region. The Columbia River and its dams provide many benefits to the northwest, including:

—Navigation from the Pacific Ocean to Lewiston, Idaho.
—Electricity, about 70 percent of that used in the northwest.
—Irrigation of close to 6 million acres.
—Recreation on the river and its reservoirs.
—Fish and wildlife habitat.
—Flood control.

As the region seeks a balance among these competing demands for Columbia river water, there are many trade offs. For example, the region is presently in the early stages of two critically important administrative processes, the proposed listing of salmon as an endangered species, and the Columbia River System Operation Review. In these proceeding, the Federal agencies must attempt to balance environmental concerns with economic values. NIU is attempting to work constructively with other water user groups, utilities, environmental groups, fish agencies, and others to reach practical and mutually agreeable solutions to the problem of accommodating increased competition for Columbia River water. We appreciate that you and others in the northwest congressional delegation have an understanding of the

importance of water to the economic health of this region and that environmental and economic concerns must be balanced.

NIU is an association of 29 consumer-owned utilities from eastern Washington, Oregon, and Idaho. Ninety-five percent of the irrigation load served with BPA power is provided through NIU members. NIU is vitally interested in the continued availability of adequate water for irrigated agriculture. Agriculture is the base of the economy in the area where NIU members serve. Without irrigation, our communities and our utilities cannot survive. The availability of water is only half of the equation; farmers must also be able to afford the energy costs to pump water onto their fields. For this reason, we are also very concerned about power rates. Thus, NIU members and their retail customers are very interested and concerned with water policy and with your legislation to establish a Commission to review Western Water policy.

S. 1996 would establish a Commission to examine the entire range of water resource problems facing the 19 Western States. In this respect, it is similar in scope and purpose to the National Water Commission established by Act of Congress in 1968. It appears to me that the Commission envisioned under your bill would be charged with updating the national Water Commission's 1973 Report with respect to water issues in the West.

Certainly a great deal has happened in the area of water policy since 1973 and the pace of change is accelerating fast. Earlier I mentioned the endangered species petitions for salmon being considered by the National Marine Fisheries Service and the System Operation Review of the Columbia River being performed by BPA, the Corps and the Bureau of Reclamation. These are only the most dramatic and obvious examples of potential changes in water use and policy in the northwest.

Environmental Regulations at the Federal and State level have affected all aspects of water policy and are administered by a number of agencies, including the Corps, the Bureau and EPA. BPA plays an important regional role and a variety of State agencies are increasingly involved.

Environmental Regulations at the State level in the northwest include proposals for water conservation standards, protection of groundwater quality, protection of wetlands, and others. These are either working their way through State legislatures and regulatory agencies or are already adopted. And the northwest is not unique. For example, I understand that in Arizona there is a new groundwater management law and in California there is a new law regulating interbasin transfers of water within California.

The point is, that there are changing concepts about what is the most beneficial use of water. There is a growing concern about environmental problems related to water supply. These changing concepts have brought about changes in policy and regulatory structure in a piecemeal fashion from State to State and from Federal agency to Federal agency.

From the perspective of a water use group, it seems clear that the forces behind these changes are not likely to abate, they are likely to become more urgent, the conflicts more intense. We are concerned about the lack of certainty and the increasingly complex, if not, confused policies. The people we represent are dependent for their livelihood on the Columbia river. There are enormous economic consequences to these decisions about competing uses and there are valuable property rights, that is, water rights, which are affected.

Because these changes are not likely to stop, we feel that we must be involved in the decision making process to assure that the rights of water users are considered and protected and the economic tradeoffs are properly evaluated. We have a huge economic stake in water policy decision, and we cannot ignore these changes or simply oppose them. We must participate and seek constructive and practical solutions to competing demands on the resource.

We endorse your bill S. 1996, as a means of studying and identifying the changes which are going on in water resource policy, identifying means or better reconciling and coordinating competitive demands and examining institutional issues at the State and Federal level. I would add, that we have no specific complaints at this time about how the Federal agencies coordinate their efforts or about the State-Federal institutional relationship; however, it would be a valid exercise to examine these relationships.

We endorse your bill with some caution, because if such a Commission is established, it will be critical that those appointed to serve represent a balanced cross section of views and interests including irrigated agriculture, and that the Commission is properly staffed. The credibility of the Commission will depend on balance and fairness and on it producing a professional report based on good information and good staff analysis.

I might note that the Commission could be specifically directed to consider programs which would be of special interest to the northwest. For example, there have been various proposals that as part of the System Operation Review there should be a study of regional site specific irrigation conversation opportunities. It would be much more appropriate to have a body such as the Commission study existing conservation programs and additional opportunities for conservation. Another possibility for study is the question of whether it is feasible to develop a program for recharging aquifers in eastern Washington and eastern Oregon. There may be other opportunities to do useful studies of particular benefit to the northwest.

In sum, water is the economic life blood of this region. We are in a period of increasing competition for water resources and increasing regulatory requirements on usage. Concepts of beneficial use are evolving. Agricultural users have much at stake and cannot ignore these issues or flatly oppose change. We must participate and attempt to shape change. We must suggest constructive alternatives. I believe that your bill S. 1996 has a valid purpose. An update of the National Water Commission's 1973 Report would be useful and there are certainly a wide array of changes which have occurred since 1973 to study. While we are not dissatisfied with existing institutional arrangements, there may be room for improvement and study of this issue would be helpful.

NIU has a continuing interest in the progress of S. 1996 and should it become law, we would certainly want to participate in the Commission's efforts. We hope you will feel free to call on us as this legislation proceeds.

Senator HATFIELD. Thank you Mr. Lovelin, we will feel free to call upon you.

Mr. Lovelin, a few years ago we reviewed the so-called water program under the Reclamation Act. And we felt that it was important to raise the acreage to a figure that would stop the basic preemption or use by large corporate farms. And this had a great focus on California. We put a new limit at 960 acres at that time. And now we have a bill before our committee which would further review a potential reform after, I must say, the West Haven Trust in California, that indicates that there has been a continuation of this kind of water use by large corporation farming rather than by the initial reason for the act, which was to help small enterprises. I am sure you are familiar with that. It is going to have an impact on irrigation all over this country beyond just those corporate entities in California. How do you look at this particular piece of legislation? Do you feel the reform is warranted and what you see as a practice of irrigators in the agricultural community?

Mr. LOVELIN. Well, Senator, we have not taken a position yet on that bill. However, my impression on the 960-acre limitation—there has been a review done in the Pacific Northwest. And we do comply, based on the information I have read, with that limitation.

Senator HATFIELD. You are distinguishing California practice from the Pacific Northwest?

Mr. LOVELIN. Yes, correct, Senator.

Senator HATFIELD. All right. Mr. Muys, we will now hear from you. Thank you for your presence.

## STATEMENT OF JEROME C. MUYS, NATIONAL HYDROPOWER ASSOCIATION

Mr. MUYS. Thank you, Senator Hatfield. I am an attorney in Washington, D.C. representing the National Hydropower Association today, which is a national trade association——

Senator HATFIELD. Aren't you glad you are in Oregon rather than in Washington, D.C. today?

Mr. MUYS. Oh, yes. I read the weather report. Our members include owners and developers of hydroelectric projects from all regions of the country and all segments of the industry. NHA appreciates the opportunity to present its views on the water policy study which S. 1996 would mandate, which we believe is particularly timely and necessary. The most recent comprehensive review of national water policy was carried out by the National Water Commission 20 years ago. That was an excellent report; although, many of its recommendations have not yet been implemented. Unfortunately, from NHA's viewpoint, did not address issues under the hydroelectric licensing provisions of the Federal Power Act. Moreover, there have been significant developments in the water resources field since that time that justify a review of present national water policies.

I would like to highlight three general areas of national water policy that we feel need a kind of comprehensive, detached consideration which only an independent commission can bring to them and which, in my opinion, is not a realistic assignment for already overburdened congressional committees.

The first general area meriting Commission attention is the question of the role of Western State water laws that interfaces with various Federal water resource programs. With respect to the Federal Reclamation Program, in 1978 the Supreme Court held that the Secretary of the Interior must comply with State law unless it directly conflicts within express provisions of the reclamation law. That decision comports with the National Water Commission recommendations.

The role of State law with regard to water projects constructed by the Corps of Engineers is less clear. Although Congress has not expressly directed the Corps to follow State law, the Corps' general practice is to do so.

With respect to the hydroelectric project licensing provision of the Federal Power Act of 1920, Congress deliberately departed from the pattern it had followed in the Reclamation Act. Because of the fundamentally different nature of the regulatory program it was creating and because power generation does not involve a consumptive use of water, Congress did not direct either the Federal Power Commission or project licensees under the act to acquire their water rights under State law, but rather it vested exclusive control of all aspects of such licensing in the commission. However, it did preserve certain existing State laws and vested rights in section 27 of the act, which the Supreme Court has characterized in its First Iowa decision as proprietary rights.

On May 21st of this year, the Supreme Court, in a rare unanimous decision in *California* v. *FERC*, reaffirmed its First Iowa rejecting California's contention that section 27 preserved the authority of States to require licensees to comply with State water permit conditions related to the maintenance of minimum stream flows. The hydroelectric utility industry supported FERC's exclusive authority as related to instream flow for fish and wildlife affected by license projects. And I would like to submit a copy of the industry brief before the Supreme Court for the subcommittee's files, if permissible.

Legislation has recently been introduced to overturn the Rock Creek decision by requiring all hydro project applicants and licensees to acquire all necessary water rights under State law and to comply with all conditions in State water right permits, even if inconsistent with FERC imposed license conditions. NHA believes that any proposal for wholesale reversal of longstanding Federal policy under the Federal Power Act more appropriately should, first, be the subject of the kind of comprehensive review proposed by S. 1996.

Moving to the Environmental Protection Agency, the Clean Water Act programs as administered by EPA have also caused concern to the Western States because of the threatened adverse impact of water quality requirements on the quantity and authorized uses of State water rights as well as interstate compact allocations. Various proposals give EPA a greater role in groundwater management, have caused further concern about possible Federal preemption of an area traditionally a matter of solely State control. None of these problems were reviewed by the National Water Commission.

Another Federal issue is the judicially created concept of the Federal "reserved" water rights. The most significant impact of the concept to date has been with respect to reserved rights for Indian reservations, inasmuch as the Supreme Court, in Arizona against California, held that the measure of such Indian rights of five reservations on the lower Colorado River is the quantity needed to satisfy the reasonable requirements of all the practicably irrigable acreage on the reservation. The major issue is whether that test should be the mandatory measure of reserved rights for all Indian reservations.

Another controversial issue is whether Indian water rights may be sold for use off the reservation, which no court has yet squarely dealt with. Congress, however, has approved several settlements of Indian water rights disputes in which off reservation use was permitted in accordance with the provisions protecting the rights of the users not parties to the settlement. More such settlements are in the mill. And the underlying legal and policy issues should be resolved.

With respect to Federal reservations other than Indian reservations, the highly controversial issue is whether the reserved water rights doctrine does or should apply to Federal wilderness areas.

While the issue has not yet been resolved by the courts, in some recent individual State wilderness acts, Congress has expressly reserved an unspecified amount of water for wilderness purposes, leaving the difficult question of quantification to the courts. Those such reservations, in the upper reaches of national forests, should not pose a threat to many existing water users, since there are few diversions in those reaches of the stream. The more serious impacts will stem from wilderness designations from the 25 million acres of BLM wilderness study areas, which are generally located at lower elevations and are interspersed among existing uses.

The National Water Commission made a number of recommendations with respect to institutional approaches to water resources management, which merit serious consideration. However, much has happened since that time. I just want to briefly use as an illus-

tration the impact on FERC's licensing authority on the Federal Power Act. The last 20 years have seen increasing inroads on FERC's exclusive authority over the licensing of hydro projects.

In 1920, Congress centralized decision-making on hydro projects with the Federal Power Commission and charged that with the exclusive role of soliciting, evaluating, and coordinating the views of the affected Federal and State agencies in reaching its licensing decisions. This centralized approach that served the Nation well has been subject to significant stress in recent years, which threatens to cause unreasonable delay and conflict in the licensing process. One source of tension is the increasing efforts of the States to obtain a stronger, indeed, dominant role in the licensing process. Another is the effort of the Forest Service and the BLM to exercise independent authority to impose conditions on a project's use of Federal lands under their jurisdiction.

There also appears to be an increase in tendency by the Bureau and Corps to restrict licensing opportunities of their dams.

Finally, on the environmental front, the dredge and fill permit requirements of section 404 of the Clean Water Act threaten to elevate the Corps and EPA into a dominant position in the licensing process. Similarly, attempts are being made by the States to use section 401 of the act to impose conditions on projects that are inconsistent with their FERC licenses.

National Hydropower Association believes that there is a serious need to look at the foregoing trends to determine whether, as NHA believes, they run counter to future effective development and management of the Nation's hydro resources.

And finally, Mr. Chairman, the last 20 years have seen a flood of Federal, State and environmental legislation, much of which impacts on water resources development. Not only are the conflicts among Federal agency programs, but between similar Federal and State programs. For example, the National Environmental Policy Act of 1970 imposed on all Federal agencies the duty to consider the environmental impacts on their proposed actions and reasonable alternatives. However, the agencies retained their discretionary authority to balance those impacts with other public interest considerations. Unfortunately, subsequent legislation such as section 404 of the Clean Water Act and section 7 of the Endangered Species Act either expressly removed that balancing discretion or has been interpreted to do so. In my view, there is a clear need to bring these recent environmental statutes into harmony among themselves and with the substantive authority of the Federal water agencies.

Mr. Chairman, I appreciate the opportunity to present some of these issues for the subcommittee's consideration and will be pleased to attempt to answer any questions you may have. Thank you.

[The prepared statement of Mr. Muys follows:]

PREPARED STATEMENT OF JEROME C. MUYS, ON BEHALF OF THE NATIONAL HYDROPOWER ASSOCIATION

Mr. Chairman, my name is Jerome C. Muys. I am a partner in the law firm of Will & Muys in Washington, D.C. and am testifying today on behalf of the National Hydropower Association ("NHA") also headquartered in Washington, D.C. NHA is a

national trade association whose members include owners and developers of hydroelectric projects from all regions of the Nation and all segments of the industry, as well as equipment manufacturers and engineering, legal, financial and consulting firms. It appreciates the opportunity to present its views on the important matters which are the subject of S. 1996.

I was asked to appear on NHA's behalf in support of S. 1996 because of my 33 years of experience in the water resources field and my involvement with two of the principal Congressionally-created natural resources study commissions of the last 25 years—the Public Land Law Review Commission, which submitted its report "One Third of the Nation's Land" to Congress and the President in 1970 and on which I served as Chief of the Legal Staff, and the National Water Commission, which submitted its report "Water Policies for the Future" in 1973 and for which I prepared a study on interstate compacts.[1] However, the views expressed herein are not intended to state NHA's official position on the merits of any of the policy matters which it believes should be reviewed by the Secretary and the proposed Western Water Review Commission ("Commission")

NHA believes that the study which S. 1996 would mandate is particularly timely and necessary. The most recent comprehensive review of national water policy was carried out by the National Water Commission 20 years ago. That was an excellent report, although many of its recommendations have not yet been implemented by Congress or the executive agencies. Unfortunately, it did not address issues under the hydroelectric licensing provisions of the Federal Power Act, which is of principal interest to NHA. Moreover, there have been significant developments in the water resources field since that time which justify a review of present national water policies. Finally, severe drought conditions over the past few years in the West have added further urgency to the need to know whether current policies are adequate to meet the Nation's needs in an effective and efficient way.

I would like to highlight a number of areas of national water policy that need the kind of comprehensive, detached consideration which only an independent commission can bring to them and which, in my opinion, is not a realistic assignment for already overburdened congressional committees to undertake. In doing so I will emphasize problems affecting hydroelectric project licensing under the Federal Power Act. Finally, I offer several suggestions as to how S. 1996 might be amended to better accomplish its goals.

There are four general areas of water resources development policy on which we believe the Commission should focus its attention. I want to stress that my emphasis on water resources development is not intended to ignore the important role that appropriate water conservation programs can play in making more efficient use of our available water supplies. NHA views the need for conservation as an essential component of any comprehensive national water resources management strategy.

### A. FEDERALISM ISSUES

The first general area meriting Commission attention is the longstanding, always emotional question of the role of western State water law as it interfaces with various Federal water resource development programs. From the earliest days of western public land legislation, beginning at least as early as 1866, Congress has deferred to State law as controlling the acquisition of water rights for development purposes in the western States. Over the years the western States developed their unique systems of water rights, generally based on the appropriation doctrine, the essential elements of which are that water rights are acquired by actual use which, if maintained with reasonable diligence, confers a priority on each user against subsequent users on a stream. (Some States, such as Oregon and California, have mixed systems of appropriative and riparian water rights.)

#### *1. Bureau of Reclamation*

When Congress assumed a major role in western water development with the enactment of the Reclamation Act of 1902, section 8 of that Act (43 U.S.C. §§ 372, 378) carefully preserved the integrity of those western legal systems and directed the Secretary of the Interior to comply with them in carrying out the Federal reclamation program. In the late 1940's and 1950's the Bureau of Reclamation began to assert a Federal prerogative to override State law in particular circumstances and was sustained by the Supreme Court in several cases which essentially read section

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[1] For analyses of the origins and operations of these two commissions, see Muys, "The Public Land Law Review Commission Study—Issue and Interests," 3 Natural Resources Lawyer 315 (1970), and Liebman, "The National Water Commission—Problem and Issues," 5 Natural Resources Lawyer 640 (1972).

8 out of the Reclamation Act. However, in 1978 the Supreme Court in *California* v. *United States*, 438 U.S. 645, distinguished those earlier cases and restored what I believe to be the proper Congressional intent in section 8, namely that the Secretary must comply with State law in carrying out the Federal reclamation program unless it directly conflicts with express provisions of the reclamation law. The *California* decision comports with what the National Water Commission recommended as the proper roles of State and Federal law under the reclamation program.

*2. Corps of Engineers*

The role of State law with regard to water projects constructed by the Corps of Engineers is less clear, principally because Congress has not expressly directed the Corps to follow State law as it has in section 8 of the Reclamation Act. The 1944 Flood Control Act recognizes, as a matter of policy, "the interests and rights of the States in determining the development of the watersheds within their borders and likewise their interests and rights in water utilization and control." 33 U.S.C. § 701-1. The Act also directs that the beneficial consumptive use of water at Corps projects for domestic, municipal and industrial purposes is to have priority over the use of water for navigation in States west of the 98th Meridian. *Id.* at § 701-1(b). Most important, the corps' practice is to comply with State water law in operating its projects. The proposed Commission may want to consider whether that policy should be more clearly stated in legislation.

*3. Federal Energy Regulatory Commission*

With respect to the hydroelectric project licensing provisions of the Federal Power Act of 1920, Congress deliberately departed from the pattern it had followed in the Reclamation Act of 1902. Because of the fundamentally different nature of the regulatory program it was creating, and because power generation does not involve the consumptive use of water, Congress did not direct either the Federal Power Commission, now the Federal Energy Regulatory Commission ("FERC") or project licensees under the Act to acquire water rights necessary for hydroelectric power generation under State law, but vested control of all aspects of such licensing in the Commission. However, it did preserve certain existing State water laws and vested rights thereunder in section 27 of the Act, (16 U.S.C. § 821), which the Supreme Court in its 1946 decision in *First Iowa Hydroelectric Coop.* v. *FPC*, 328 U.S. 152, characterized as "proprietary". Moreover, in 1955, in *FPC* v. *Oregon*, 349 U.S. 435, the famous *Pelton Dam* decision, the Court held that whatever kinds of State laws section 27 had reference to, they were not applicable to a proposed hydro project located on Federal "reservations", as opposed to "public domain" lands. The *Pelton Dam* decision caused a strong reaction among western members of Congress and spawned a number of proposals in ensuing years to require all Federal agencies to comply with State law in carrying out their programs, but none were enacted. Most recently, on May 21st of this year the Supreme Court, in a rare unanimous opinion in *California* v. *FERC*, reaffirmed its *First Iowa* interpretation of the scope of section 27, rejecting California's contention that section 27 preserved the authority of the States to require licensees to comply with State water permit conditions inconsistent with FERC-imposed license conditions relating to the maintenance of minimum stream flows. NHA and all other segments of the hydroelectric utility industry filed a brief in support of FERC's exclusive authority as related to instream flows for fish and wildlife affected by a licensed project. I would like to submit a copy of the industry brief before the Supreme Court for the subcommittee's files.

Senators McClure and Garn and Rep. Craig have recently introduced legislation to overturn the *Rock Creek* decision by requiring all hydro project applicants and licensees to acquire all necessary water rights under State law and to comply with all conditions in State water right permits, even if inconsistent with FERC-imposed license conditions. NHA believes that consideration of such a proposal for wholesale reversal of long-standing Federal policy more appropriately should first be the subject of the kind of comprehensive review proposed by S. 1996.

*4. Environmental Protection Agency*

The Clean Water Act programs administered by EPA have also caused concern to the western States because of their potential adverse effect on State-created water rights. The impact which water quality requirements sometimes impose on the quantity and authorized uses of State water rights, as well as interstate compact allocations,[2] appears to run counter to the language of the Wallop Amendment

[2] See, Bloom, "The Effects of Interstate Water Quality Controls on Legal and Institutional Water Allocation Mechanisms—Can the Environmental Protection Agency Amend an Interstate

Continued

which attempts to protect State water allocation procedures and rights thereunder from impairment by programs authorized by the Clean Water Act. 33 U.S.C. § 1251(g). Various proposals in recent years to give EPA a greater role in groundwater management have caused further concern in the western States about possible Federal preemption of an area traditionally a matter solely of State control. None of these problems were reviewed by the National Water Commission because they stem from programs that were only authorized by Congress in the Federal Water Pollution Control Act Amendments of 1972, just a year before the Commission submitted its report. Consequently it seems likely that this should be a significant part of the Commission's study program.

*5. Federal Reserved Water Rights*

An exception to the traditional Congressional deference to State water law for the acquisition of water rights for Federal programs is the judicially created concept of Federal "reserved" water rights. This concept, which had its origins in the Supreme Court's 1906 decision in *Winters* v. *United States*, 207 U.S. 564, relating to Indian reservation lands and was refined in 1963 in *Arizona* v. *California*, 373 U.S. 546, and in 1978 in *United States* v. *New Mexico*, 438 U.S. 696, holds that when Congress or the Executive Branch "reserves" Federal lands for specific purposes, such as an Indian reservation or a national forest, it also reserves enough "unappropriated" water to satisfy the reasonable needs of the primary purpose of the reservation with a priority date as of the creation of the reservation. Water for secondary purposes must be acquired under State law. The concept operates to give Federal reservations, most of which were created in the 19th Century, earlier priorities than the appropriative rights of non-Federal users under State law. The most significant impact of the concept, at least to date, has been with respect to reserved rights for Indian reservations, inasmuch as the Supreme Court in *Arizona* v. *California* held that the measure of such Indian rights is the quantity needed to satisfy the reasonable requirements of all the "practicably irrigable acreage" on the reservation. This concept produces a substantial unquantified first lien on most western waters.

The Public Land Law Review Commission recommended in 1970 that all reserved rights be quantified by the Federal agencies and filed with the States as a matter of comity to eliminate uncertainty as to the scope of the Federal claims and to permit realistic water planning for the future. The National Water Commission advocated another approach in 1973, concluding that quantification of existing reserved rights was best left to individual judicial stream adjudications throughout the West on a case-by-case basis and that water for future Federal needs on reserved lands be acquired pursuant to State law. Two major issues have surfaced since that time. First is whether the "practicably irrigable acreage" test is the mandatory measure of reserved water rights for Indian reservations. After granting certiorari in 1988 in *Wyomina* v. *United States* to decide that question (the first time the issue had reached the Court since its 1963 *Arizona* v. *California* decision) the Court was equally divided on the merits in 1989, 109 S. Ct. 2994, so that the Wyoming Supreme Court's decision applying the practicably irrigable acreage test was left operative. Bitter disputes on the Wind River Indian Reservation concerning enforcement of that decision have since erupted.

Another aspect of Indian reserved water rights that has been a recent source of controversy is the question of whether such rights may be sold for use off the reservation. While this question has generated much scholarly debate, no court has yet squarely dealt with the issue. Congress, however, has approved several settlements of Indian water rights disputes in which off reservation use was permitted in accordance with provisions protecting the rights of users not parties to the settlement. More such settlements are in the mill. The underlying legal and policy issues will have to be resolved, either generally or on a case-by-case basis, if Indian Tribes are to be able to market unused reserved water rights off their reservations to needy non-Indians without impairing other existing uses. Reaching a consensus on this issue will be a substantial challenge, and I believe the Commission should examine ways in which Congress and the Federal agencies could take a more constructive role in facilitating such settlements.

With respect to Federal reservations other than Indian reservations, a highly controversial issues is whether the reserved water rights doctrine does, or should, apply to Federal lands set aside as wilderness areas. An Interior Department Solicitor's

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Compact?," 22 Rocky Mt. Min. L. Inst. 917 (1976); Muys, "Quality and Quantity: The Federal Water Pollution Control Act's Quiet Revolution in Western Water Rights Administration," 23 Rocky Mt. Min. L. Inst. 1013 (1977); Hobbs & Raley, "Water Ouality v. Water Quantity: A Delicate Balance," 34 Rocky Mt. Min. L. Inst. 24-1 (1988).

opinion concluding that there is no implied reservation of water for wilderness areas has been concurred in by the Justice Department. Two Federal district courts have split on whether such reservations may be implied from the act of setting aside such lands, and the Tenth Circuit recently held that the issue, in its present posture, is not ripe for decision.

While the issue was reaching stalemate in the courts, Congress began to address the issue in individual State wilderness acts by expressly reserving an unspecified amount of water for the purposes for which wilderness is established, leaving the difficult question of quantification to the courts. The consensus appears to be that reserving water for wilderness purposes in the upper reaches of national forests should not pose a threat to many existing water users, since there are few diversions in those reaches of a stream. However, such reservations may frustrate future water projects which plan to divert water upstream from a wilderness area. The more serious impact of such reservations will stem from wilderness designations from the 25,000,000 acres of BLM wilderness study areas, which are generally located at lower elevations and are interspersed among existing uses. While the relatively junior priority dates of such reservations should not impact existing uses, those reservations may impede future changes of use or diversion points by existing users and frustrate new upstream uses. The critical issue appears to be whether such reservations should create a right to an undiminished flow in the wilderness area at the time of the reservation or some lesser measure of "reasonable need." Unfortunately Congress has not dealt with this issue in the express statutory reservations it has made to date. This issue has been the most controversial aspect of the Arizona BLM wilderness bill passed by the House and now pending before the Senate, and several western Senators have expressed serious reservations about that aspect of the bill. In my view it would be desirable to develop a consensus on a generic approach to this question, rather than dealing with it on an inconsistent case-by-case basis as was done with the language "releasing" the multiple use prohibitions in the RARE II national forest wilderness bills. In any event, it seems to me that the first question that should be asked in this regard is whether State law provides an adequate mechanism for meeting the water needs of Federal wilderness areas and, if so, why there is any need for Congressional reservations of water.

### B. INSTITUTIONAL ISSUES

The National Water Commission took a hard look at various institutional approaches to water resources management and made a number of recommendations which merit serious consideration. However, much has happened since 1973 in the institutional arena which should be reviewed. For example, the Pacific Northwest Electric Power and Conservation Planning Council created by Congress in 1980 (16 U.S.C. § 839b) is a new institutional approach to management of regional power and other resources that should be evaluated. Similarly, existing interstate compact allocations have become even more outmoded in a number of ways since that problem was highlighted by the National Water Commission. Another significant development is that the role of the Federal water project construction agencies has begun to change dramatically because most feasible major projects have been constructed. Thus a "new" Bureau of Reclamation is presently charting a course to assist State and local water users in water "management", while the Corps of Engineers similarly is giving increasing prominence to environmental programs. This trend necessarily gives rise to the decades-old question of whether it makes sense to continue to have two independent Federal water project construction agencies or whether the water resources development responsibilities of the Corps and the Bureau should be consolidated into a single agency, perhaps within a new Department of Natural Resources.

Finally, the last 20 years have seen increasing inroads on the FERC's exclusive authority over the licensing of hydro projects on the Nation's streams, public lands, and Federally constructed dams. Before the Federal Power Act was enacted in 1920, the acquisition of necessary Federal approval to construct a hydro project on public lands or navigable waters was a cumbersome, piecemeal process. If a project was on national forest lands, a limited duration special use permit was required from the Secretary of Agriculture. A similar procedure was followed before the Secretary of the Interior if public lands under that department's jurisdiction were occupied. Where navigable waters were involved, special legislation was required along with approval from the Secretary of War.

In 1920 Congress centralized decision-making on hydro projects by creating the Federal Power Commission comprised of the three Secretaries with responsibility over the affected Federal lands and waters. This troika was later replaced by a Commission comprised of five presidential appointees who were charged with soliciting,

evaluating and coordinating the views of the affected Federal and State agencies in reaching their licensing decisions. This centralized approach in which the FERC serves as the exclusive evaluator of proposed projects for developing the hydro potential and affected water resources of a river basin has served the industry and the Nation well, but has been subject to significant stress in recent years which threatens to cause unreasonable delay and conflict in the licensing process. One source of tension is the increasing efforts of the States to obtain a stronger, indeed dominant role in the licensing process. Another is the effort of the Forest Service and the BLM to exercise independent authority to impose conditions on a project's use of Federal lands under their jurisdiction, a contention that was strengthened by the Supreme Court's 1984 decision in *Escondido Mut. Water Co.* v. *La Jolla Band of Mission Indians*, 466 U.S. 765 (1984). More recently, those agencies claim the authority under section 501 of the Federal Land Policy and Management Act of 1976, 43 U.S.C. § 1761, to deny rights of way on lands under their jurisdiction for the construction of hydro plants. If this position is ultimately sustained by the Courts, the result would appear to be a reversion to the piecemeal licensing process which the Federal Power Act originally sought to eliminate.

There also appears to be an increasing tendency to restrict FERC licensing opportunities at Federal dams. While the courts have held that FERC has no jurisdiction at Federal dams whose authorizing legislation includes power development, it is often difficult to ascertain whether or when either the Bureau or Corps intend to exercise that authority or for applicants to comply with conditions those agencies impose for licensing. This leaves the power development in limbo even though there may be entities interested in developing that potential under the Federal Power Act.

On the environmental front, the courts have held that the dredge and fill permit requirements of section 404 of the 1972 Clean Water Act, 33 U.S.C. § 1344, apply to projects subject to FERC's jurisdiction, which threatens to elevate the Corps and EPA into a dominant position in the licensing process. Similarly, attempts are being made by the States to use other sections of the Clean Water Act, such as section 401, 33 U.S.C. § 1341, to impose conditions on project operations that are inconsistent with their FERC licenses.

NHA believes there is a serious need to look at the foregoing trends to determine whether they pose a significant threat to the centralized decision-making embodied in the Federal Power Act which NHA believes is essential to future effective development and management of the Nation's hydro resources.

### C. IMPACT OF SINGLE FOCUS ENVIRONMENTAL LEGISLATION

The last 20 years has seen a flood of Federal and State environmental legislation, much of which impacts on water resources development. Not only are there conflicts among Federal agency programs, but between similar Federal and State programs, such as those concerning preservation of rivers and threatened or endangered species. On the Federal side, the National Environmental Policy Act of 1970, 42 U.S.C. §§ 4321 et seq., imposed on all Federal agencies the duty to consider the environmental impacts of their proposed actions and reasonable alternatives to proposed actions. However, the agencies retained their discretionary authority to weigh those impacts with other public interest considerations in making their final decisions. Subsequent legislation has either expressly removed that balancing discretion or been interpreted to do so. Thus section 7 of the 1973 Endangered Species Act, 16 U.S.C. § 1536, expressly precludes Federal agency actions, such as building or licensing water resource development projects, which adversely affect a listed species or its habitat. Similarly, under section 404 of the 1972 Clean Water Act, the Corps of Engineers and EPA in recent years have belatedly asserted the power to require Federal, State and private agencies desiring to construct a water facility to pursue the least environmentally damaging alternative project, even though that kind of final decisional authority had been preserved in the Federal agencies 2 years earlier in NEPA. In my view, there is a clear need to bring these recent environmental statutes into harmony among themselves and with the substantive authority of the Federal water agencies.

### SUGGESTED AMENDMENTS TO S. 1996

NHA suggests the following amendments to S. 1996:

(1) It would be desirable to shorten the study time frame to 3 years. The studies and recommendations of the National Water Commission should provide a solid foundation for less comprehensive supplemental studies and analyses of developments over the past 15 years. Providing a 5 year period might activate Parkinson's

Law—"work expands to occupy the time available to do it"—and our national water problems cannot afford that luxury.

(2) Because of the critical Indian reserved water right issues that the Commission must necessarily address, it would be desirable to add the ranking members of the Senate Committee on Indian Affairs to the Commission. At the risk of having an unwieldy Commission, it would probably also be desirable to add the ranking members of the Senate Environment and Public Works Committee and the House Energy and Commerce Committee to facilitate implementation of any Commission recommendations affecting matters within their jurisdiction.

(3) One of the most frequent complaints about the report of the Public Land Law Review Commission was that it did not prepare draft legislation to implement its proposals. The PLLRC made a non-unanimous decision not to do so, largely to give its legislative members flexibility to consider alternative approaches to achieving the Commission's recommended goals. The National Water Commission similarly decided not to prepare draft legislation, but this subcommittee may want to consider whether to require the proposed Commission to do so.

Mr. Chairman, I appreciate the opportunity to present some issues for the subcommittee's consideration and will be pleased to attempt to answer any questions you may have.

Senator HATFIELD. Mr. Muys, I am grateful that you took the time and made the effort to be here. And probably you have more history and perspective of time and involvement over the years than any of our other witnesses today. Of course, you are fully aware of the fact that back in the 1920's, Secretary of Commerce Herbert Hoover helped negotiate out the Interstate Compact leading to the development of the major first of our national reclamation of water projects, the Hoover Dam. And then as President of the United States and every President since Mr. Hoover has recommended a comprehensive water policy for this country. You served on the Public Land Law Review Commission as a counsel. One of its major recommendations was a comprehensive water policy. And I can cite other examples of where this has been urged and recommended and bade the recommendations of some major study. Mr. Muys, why hasn't it happened?

Mr. MUYS. Well, I have my opinion, Senator. I think there is a certain amount of—not a certain amount of, a great deal of turf protection among the agencies. And I might say, Senator, even under the dome where you serve, committee jurisdiction over the years, particularly in the era when there were very strong committee chairmen, the tendency has been to protect subject matters within a particular committee's jurisdiction, not to, in my opinion, transfer jurisdiction or consolidate in a way that might be in the overall national interest.

In the days when it was politically beneficial to get water projects in your district, of course, I think it was easier for many members to get Corps projects and Bureau projects from particular committees. And whether that is still true today, when getting a water project in your State may not get you reelected, but may get a demonstration from local environmental groups maybe has changed that perception, but I think there has been a certain amount of parochialism that maybe is eroding, but certainly, I think, has been the principal cause.

Senator HATFIELD. Now, what is it going to take to submerge those parochial perspectives into a national perspective? Because those parochial perspectives are only going to be guaranteed in terms of longevity of involvement and use and so forth when we

get a national perspective. It is not going to displace, it is going affirm, as I look at it, their needs and their uses.

Mr. MUYS. I think the process you are trying to get in place here is the first thing we need, an independent commission that has legislators on it, not just the blue ribbon Presidential commission like the National Water Commission, so that the legislative members temper their recommendations with the practicality and the needs they see up on the Hill and they will work to implement them. The commission's recommendations also ought to have on the commission a broad representation of various interest groups around the nation, to have advisory counsel such as you propose reflecting all the interest groups, inviting the governors to designate representatives to work with the commission so they have the whole water community focusing on this problem spurred by the situation we have had over the last 3 or 4 years of increasing drought problems, which are bringing a crisis sense to the Congress, which is what usually spurs Congress into some action. I think you probably have as good a chance of getting something done now as there ever has been.

Senator HATFIELD. Do you know Mr. Norton Heely?

Mr. MUYS. My former partner.

Senator HATFIELD. Well, as you may recall, a number of years ago Senator Jackson, who Chaired our committee at that time, invited Mr. Heely who, by the way, for the record, is still living, I believe.

Mr. MUYS. Yes. He is still practicing law. He is 85 years old.

Senator HATFIELD. He was the legal counsel, at least in the early days, of helping establish the Hoover project and the negotiations of that first Interstate Compact. He was invited, at the age—I think he was nearing 80 at the time, if not only already 80, to testify before our committee. And he came forward without a note. And for about 40 minutes this man, without a note, gave us a recitation of a national energy water policy that—I have never seen a committee do this. But after he finished, they applauded. The Republicans applauded, the Democrats applauded, everybody applauded and the audience applauded. I thought, at that moment, Mr. Muys, we could have passed a national water policy at that committee. But we have had such wonderful resources. And you represent a line of those resources of people who have this vision.

And I really feel frustrated when we have had such indisputable levels, professional levels, professional testimony from every possible angle and yet the inertia or somehow the obstacle that prevents us to move on that action—I have almost come to the conclusion about like the only way we are going to get a deficit program is to have a week or two of a sequestration and that is when people are going to act. But are we going to have to a major—when I say major, unknown before crisis of such proportions before we move?

Mr. MUYS. Well, I think some are looming certainly down in the Southwest where we do a lot of our practice or on the edge of it now. The swimming pools are not as full as they used to be down in Los Angeles.

Senator HATFIELD. Well, I thank you again. And I am impressed to know about your association with Mr. Heely. I have a great respect for this man.

Mr. MUYS. He is a great man. I think it had something to do with the school he attended.

Senator HATFIELD. Pardon?

Mr. MUYS. He was an alumnus of your alma mater——

Senator HATFIELD. Oh, yes.

Mr. MUYS [continuing]. As you will recall. So I think there is something there in the Bay area.

Senator HATFIELD. Very close to former Secretary of the Interior, president of Stanford.

Mr. MUYS. Ray Lyman Wilbur?

Senator HATFIELD. Ray Lyman Wilbur. Some people go through life with three names and some of us go through with two names that are hard to remember on occasions. But Ray Lyman Wilbur was one of those people. Thank you.

Mr. MUYS. Thank you.

Senator HATFIELD. Kathryn Brigham now is going to represent the Confederated Tribes of the Indian Reservation, Umatillas. I want to make a point here before you start your testimony. We have been dealing with user groups. We have been dealing with Federal agencies, with regional agencies and State agencies. And I think we always have to reiterate this because of the unique standing of the Indian-American to this country. It is a relationship based upon treaty. And, I think, sometimes we see the Indian-Americans as being another segment as we might classify the German-Americans or the Italian-Americans. This is not so. And, I think, we have to understand that the treaties made under the Constitution constitute the supreme law of the land as does our Constitution and the statutes made.

So when we hear from Ms. Brigham, I want to make this preface because I think it is awfully important to consider this preface. We have obligations that cannot be changed except by a mutual agreement with the treaty parties, the parties to the treaties, and it is not something that we can legislate to, in any way, diminish those treaty rights. And it is almost as if we were sitting here with Canada and Mexico trying to work out a continental wide arrangement on allocation of water, to bring it down to the specific. We are not sitting here with another participant of this hearing or later, if we get into the legislative field, merely trying to coordinate entities and peoples within this country. So I just wanted to make that as a preface to your remarks, Ms. Brigham, and welcome you to this conference.

## STATEMENT OF KATHRYN BRIGHAM, CONFEDERATED TRIBES OF THE UMATILLA RESERVATION

Ms. BRIGHAM. Thank you, Mr. Hatfield. I am very pleased to sit in. I also would like to say that when you are talking about your frustration that you are dealing with in trying to get things done, that is exactly what the tribes have been feeling for years, is trying to get people to realize that the resources are here and we can use them, but as long as we use them well, they will always be here, but if we misuse them, then they are going to start depleting and we will no longer have them here. So I thank you.

As for the statement from the Confederated Tribes, I am here on behalf of the water committee. The Umatilla tribe is made up of the Umatillas, Walla Wallas and tribes of Eastern Oregon. The Confederated Tribes have a long history involved in water policy. Our treaty with the United States was signed in 1855. And we have been neck deep in Federal, State, tribal and local water policy since that time for 135 years.

Many water decisions in the past 135 years in the Columbia River, Snake basins have directly impacted the Confederated Tribes. Dams built on the Columbia and Snake Rivers have demised the fisheries that used to sustain our people, but have brought inexpensive electricity and growth and development into this area.

In a concerted effort to limit these impacts, the better lives of the increased demands placed on the remaining river resources, we are working diligently with the Army Corps of Engineers, BPA, Bureau of Reclamation, U.S. Fish and Wildlife Service, National Marine Fisheries Service and other Federal and State agencies. And these agencies—I am getting all my agencies confused just listing them—are closely involved in a plan developed by the tribe to increase Umatilla water river flows to bring back salmon into our reservation.

Senator Hatfield, you know the water basin project well and have been a leader in this effort to restore tribal resources and culture and we appreciate your support. The tribe is actively involved in other water resource issues ranging from implementation of—I cannot say this word—overall Oregon water and scenic river acts to working with State and Federal agencies on tribal in Northeastern Oregon and Southeastern Washington water uses, qualification and protection. All of these water uses have a common thread. The tribes must contact and negotiate with staffs and managers of up to 14 Federal agencies that have jurisdiction over water issues. In addition to these unnamed above, the U.S. Forest Service, the Bureau of Land Management, the Federal Energy Regulatory commission and the Environmental Protection Agency have jurisdiction over water and our negotiations and decisions with them often involve a lot of work.

Additionally, our water committee and board members have 12 State agencies on water issues. Though many of these agencies hold important positions in the crafting and implementing, servicing in groundwater projects, efficiency is left in the dust. Further measuring the rippling of the waves generated today by many of yesterday's project gives us a clear message that we need to do better. A vision of our land and water for the future generation is a goal often left behind in the confusion and communication of all the committees that are there.

Though our experience in this positive and beneficial water resources action are possible—and you can look at the Umatilla basin project as an example, through hard work and communication and dedication, things can be accomplished. The Confederated Tribes of the Umatilla Indian Reservation is a sovereign government that strives to achieve government-to-government basis on coordination with agencies of the U.S. Government. Too often the im-

portant government-to-government decisions are lost with all the agencies that we have to deal with.

We are concerned with the water withdrawals within the Columbia River, with the request from California and with the requests from irrigation to increased diversion. Tied visionary national water policy is needed. We look forward to working with you to develop a new policy that protects and effectuates tribal treaty rights. A good national water policy will benefit tribes and U.S. citizens by protecting National Resources Policy. And the National and Wild Scenic River Act gives an appropriate precedence in this direction. A new direction should reflect renewed commitment to belt tightening and to accomplish the need for serious conservation efforts.

I want to thank you, Senator Hatfield, for your dedication and look forward to the solution in creating a change where it is needed. And as you know, we are at the crossroad in the Pacific Northwest. Decisions made in the next couple of years will determine the fate of our people, the salmon and many of the resources. The tribes have always asked that all resources be managed for the future and we will look forward to working with you.

Senator HATFIELD. Thank you, Ms. Brigham. Ms. Brigham, in your opinion, the Interior Department has the trust responsibility to make certain that the Indian tribal rights are protected in general. But could you say how you feel they are handling that responsibility as it relates to water rights?

Ms. BRIGHAM. Mr. Hatfield, I am on the Fish and Wildlife Committee and I am very familiar with the fishing issues. And as a member of the Water Committee, I am not a part of. But in discussions with the Water Committee, we have stated some of the same frustrations of the Federal agencies, in that they are very narrow sighted sometimes and do not work with the tribes as they should be. And in fishing issues, we are working very hard to correct that and, I think, we are making some progress. And, I think, the Water Committee is also making some progress, but there is still a lot of work that needs to be done.

Senator HATFIELD. Thank you.

Ms. Frenkel, we are happy to hear from you, representative of the Oregon Chapter of the Sierra Club.

## STATEMENT OF LIZ FRENKEL, NATIONAL WATER RESOURCES COMMITTEE, SIERRA CLUB

Ms. FRENKEL. As a matter of fact, Senator, I am here today representing the National Water Resources Committee.

Senator HATFIELD. Excuse me. Could you pull that microphone a little bit closer?

Ms. FRENKEL. I am representing the National Water Resources Committee of the Sierra Club.

Senator HATFIELD. I see. Thank you.

Ms. FRENKEL. We are very glad to be here. We are not commenting on the specifics of 1996, which we did not quite connect with. We are talking about water policy. And this is your arena because it is only in Congress that this dream can perhaps can come to be a reality.

Luna Leopold, chief hydrologist of the U.S. Geological Survey, in recent lecture, said, "The national resources of the United States are a key aspect of the growing world competition. Their management is not guided by any ethos of long-term sustainability. Instead, management is stressed by a plague of special interests and a disdain for equity. As a result, the public is the continual loser."

The Sierra Club agrees with Dr. Leopold. The public should never be the loser, particularly in the management of water. Bad public policy, such as we saw at the Kesterton Refuge debacle, the Two Forks Dam, which was blocked by public opinion, not by water policy.

As members of the public, preoccupied by neither agency turf nor pecuniary interest, we believe that there is a need for comprehensive water policy, particularly water policy guided by the ethos of long-term sustainability and by the principles of equity.

By sustainability, we mean not just the ability of a hydrologic system to survive, but for that system to have dramatic flexibility to constantly adjust to changing circumstances. The water system must be able to adjust to climatic change, to natural disasters. Water management such as this requires the ability to forecast, regulate, monitor and even experiment. Implementing components of such a comprehensive policy must include effective planning, management, regulation and research.

Hydrologic systems transcend bureaucratic and technical distinctions between water quality and quantity. All aspects of water, surface and ground, wetlands, water quality and quantity must be included in the comprehensive water policy. The effect of one isolated policy on another can only be understood and resolved in the context of a comprehensive policy. Kesterton is a good example of that. Fish policy, recreational policy, agricultural policy, none of these appear to be resolved ever in the water forum.

National water policy must, for starters, reconcile inherent jurisdictional conflicts between levels of government, between States and between agencies. For example, we need only look at water management in the Columbia River basin to see these conflicts in action.

Comprehensive water policy must deal with the interaction between land use planning and water. Nearly all societal growth is dependent upon the availability of water, industrial development, municipal growth, tourism, et cetera.

A new comprehensive water policy must accommodate changing public perception. This is very important. With the Northwest Power Planning Act the public expected and got equity for fish in the management of the Columbia River. The U.S. Bureau of Reclamation, in 1987, changed their emphasis from irrigation development to water resource management. The Corps now manages section 404 permitting, which encompasses wetlands as waters of the United States. The public no longer takes quantity and quality of groundwater for granted. Toxic clean-up, high on the public's list of concern, nearly always involves pollution of surface or groundwater and often both.

An underlying principle, however, to comprehensive water policy is equity. In many forums, the Sierra Club has argued for equity. Agencies with empires to build or defend often have not incorporat-

ed all social and environmental costs into total project costs. And some Federal benefit-to-cost calculations even now quantifies social and environmental costs, but do not quantify social and environmental benefits.

Only recently have nonstructural solutions to projects been considered. Economic efficiency is seldom a criterion. Politics, not policy often controls the direction of taxpayer's dollars. Economic equity in water management decisions requires comprehensive policy.

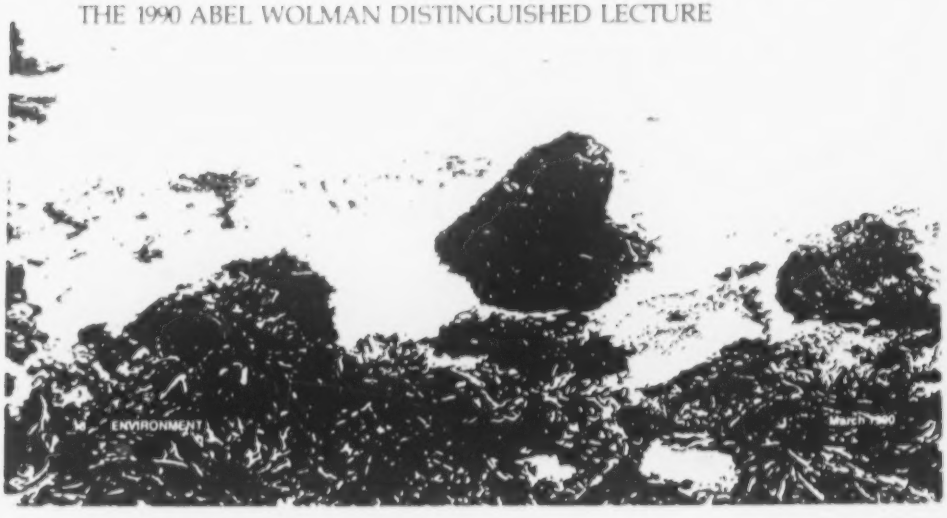
Finally, though many users today still believe water should be free, we believe that those who stand to profit must pay. Direct or hidden subsidies, in the words of Dr. Viessman, "Encourage inefficient water use, generate excessive total capital outlays to both water supply and waste water works and foster policies that perpetrate rather than manage growth in water use and development."

We support the need for comprehensive water policy. We think it is likely only with the arm of Congress will this occur. We support a national policy and we hope to work with you in the development of such a policy. Thank you very much.

[Attachments to Ms. Frenkel's statement follows:]

# ETHOS, EQUITY, and the WATER RESOURCE

THE 1990 ABEL WOLMAN DISTINGUISHED LECTURE



BY LUNA B. LEOPOLD

It was 431 B.C., the end of the first year of the Peloponnesian War, a conflict that lasted 27 years. The Athenian general and respected leader Pericles spoke to the assembled citizens concerning their strength, weakness, and prospects against the better prepared, military-minded Lacedemonians. He pointed out that the inherent advantage of democratic Athens over the oligarchy of Sparta lay in the character of its citizens, who were accustomed to freedom in their government and in their ordinary life. Pericles described this inherent character as follows: "(The) ease in our private relations does not make us lawless as citizens." The chief safeguard, he noted, is that citizens obey the customs and the laws "whether they are actually on the statute book, or belong to that code which, though unwritten, yet cannot be broken without acknowledged disgrace."

Pericles was a member of the government, in a post filled by annual election. He was also a general, but in this speech he was speaking for the government. He described, if you will, an ethos, or guiding belief, of both government and citizen. That ethos defined the character of Athens—character of both the government and the governed. But this changed. Unfortunately, "democratic government, always less decisive and certain of its direction than are more authoritarian controls, is seen at its most unstable and precarious in Athens."[1] Having disavowed Pericles' view of a defensive war and accepted Cleon's urging for a war of conquest, Athens no longer represented the "hopeful and creative

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force whose humanity, though imperfect, far surpasses the repressiveness of Sparta."[1] Athens itself became the repressor. In arrogance and conceit, Athenians attempted to conquer Syracuse and subdue all of Sicily. They failed. The ethos of Athens' earlier history was eroded and, finally, obliterated.

The unwritten assumptions of fairness, equity, and the common good gave way to domination by a narrow class and special interests. Athens lost its strength and hope at Syracuse, lost the war despite overwhelming advantages, and deteriorated to a second-class power. Alexander, when he was only 18 years of age, took Athens by persuasion, without a fight.

This ancient history is far removed in time. What is its relevance to the field of water in the modern age? Two concepts stand out. First, democratic governance at the will of the people is effective and responsive as long as there exists an ethos in administration—a set of beliefs that guide decisionmaking even though unwritten into law. Second, democratic guidance is effective when equity—fairness to all—is not submerged to private or narrow interests.

It may seem that, by citing a simplified contrast with the distant past, I wish to draw a sharp analogy between ancient and modern circumstances. My objective is much more mundane, however. I wish merely to use two concepts, well known to the ancients but latterly forgotten, in an analysis of some aspects of resource use.

The first concept concerns an ethos in administration. This Greek word *ethos* means character or tone. In the present context, the best definition is guiding beliefs. In the resource agencies of the U.S. government, ethos seems strangely absent.

In the growing realization of interdependence among biological forms and the physical environment, it can hardly be doubted that even renewable resources are suffering the impact of degradation in quality and limitations on renewability. Water can be so characterized. Not only in countries of high population density, but in the United States, water is increasingly degraded by soil erosion, chemical wastes, irrigation salts, organic overloads, and increased temperature. Of course, the technology of water treatment still allows U.S. cities to have the best water supply in the world, but the hydrologic system is under stress. In the available technology lies the rub: To most water-supply engineers, the hydrologic system as a whole is outside their domain, and they are not immediately concerned with its problem.

Farmers plowing up- and downhill (and, despite 50 years of soil conservation, many are doing just that) are interested in the productivity of their own fields. That soil erosion is changing conditions downstream is not their problem. Indeed, the county agent who advises farmers is similarly concerned with the fields—not the river basin.

Examples abound of individuals who have a personal interest in the water needed for their own operations, livelihood, and home use, but perceive no larger responsibility except to be prudent in water use. If citizens think about water at all, they feel they can rely on those persons they elect or on an organization they support to take the broader view. Among these are the federal and state agencies and individuals who have no direct monetary interest in the water they administer but whose attitudes, policies, and clientele determine in great part where, how, and how much of the water resource is utilized.

The proliferation of public agencies dealing with water has led to a disassociation of their policies, their procedures, and their outlook from the operational health of the hydrologic system. Everything one entity does affects many other entities, yet each entity operates as if it alone were the flower facing the sun. There is no guiding belief, no ethos, involving the natural world. There is no concern for the common—as Garrett Hardin expressed it—no overriding responsibility for the whole.[4]

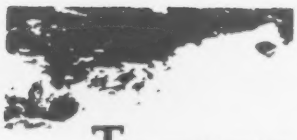
The individuals and agencies that manage water resources are, after all, the product of the public that supports them, and that public has several ways of expressing itself. One is through the Congress it elects, which more directly, if not more effectively, is the expression of the public conscience. Remember the explanation of the character of Athens. It was the character of the citizenry that was expressed in the ethos of both the government and the governed. If the citizenry becomes divorced from concern for the common good, then government itself follows in the same path. Citizens can become so divorced if they are not informed, if they do not see the consequences of neglect of the general welfare, and if they are given no insight into the operational details of how their own interests are being handled.

The ethos of which I speak is the unwritten gut feeling that the resources of the planet and the nation are worthy of husbandry—indeed, are essential to our long-term well-being.

The second concept is equity—a dedication to fairness, a desire to consider various interests and treat all with some measure of equality. We see all around us a shocking lack of evenhandedness, the pressure of special interests, and the bending under that pressure. Equity was part of the Athenian code. As Thucydides expressed it, "praise is due to all who . . . respect justice more than their position compels them to do."[5]

Agencies and individuals who manage resources have functions that are described by law but not necessarily specified by law. Thus, there is a wide range of administrative discretion not only permitted but allocated by legislative bodies. Indeed, this is as it should be, but often lacking is a guiding precept that public service means service to the whole with a sense of balance and equity. These agencies and individuals often are under pressure from self-seeking forces. As a result, dedicated public servants are captured by the history of the organization in which they work, subjected to conflicting demands, and receive no assurance from the public or any overseeing body. The result is that ethos and equity are not part of the system.

The immediate answer to this observation swells to a clamor in my ears—



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the agencies are doing just what the legislature has ordered them to do. But anyone who has been in government service knows that administrative discretion is as wide as a barn door. This very discretion permits the possibility of buckling under the pressure of outside interests. I wish to examine here the nature of the ethos and equity that I feel are needed to sustain the public interest in resource use.

What might be the form and content of a guiding direction for water agencies and the individuals who work in those agencies? In phrasing this guiding direction, a distinction should be made between ethos and policy: Policy can be written in explicit terms and can be in the form of an order, but ethos is less explicit and includes viewpoint—a guiding value that is understood but not necessarily written out.

The first component of such a guiding direction might include the following idea: Decisions in the field of water development and management should aim toward the preservation of the integrity of the hydrologic continuum.

Note that the hydrologic continuum is different from the hydrologic cycle: The latter continues for good or ill, but the idea of a continuum implies a maintenance of balance—an operational quasi-equilibrium among the processes within the hydrologic cycle. The hydrologic continuum might alternatively be called the hydrocycle, involving air, water, soil, biosphere, and people.

By hydrologic continuum, I mean the effective operation of those forces in the drainage basin that maintain a balance among the processes of rock weathering, soil formation, water and sediment delivery to stream channels, and the exit of water and sediment from the basin. These forces are both biological and physical. For example, vegetation promotes weathering, soil formation, and infiltration but mediates and modifies erosion and surface run-off.

Each part of the system modifies other parts. The flood plain reduces flood peaks. River curves maintain hydraulic resistance and help moderate velocity. Thus, both form and presence interact to insure that no part of the system accelerates beyond the limits of flexibility. This is what is meant by quasi-equilibrium.

This integrity of the hydrologic continuum is implied in the term "sustainability."[6] But, in choosing to use the phrase, I mean more than ability to exist through time. I mean the dynamic flexibility to adjust constantly through changing circumstances. The integrity of the hydrologic continuum must include adjustment to a changing climate by gradual, noncatastrophic alterations.

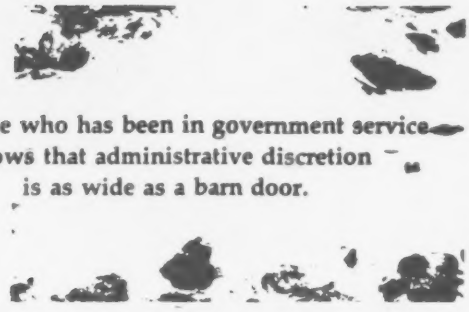
Climate has changed radically during the Holocene, indeed, within this century. As we are becoming alarmingly aware, we can expect more change in the next century. More recently than the altithermal period 3,000 to 5,000 years ago (when the climate was much warmer than at present), there was a drought lasting about 200 years that ended in about 1500 A.D. After the discovery of America by the Europeans, there was a long period of storm and cold that, in the United States, ended in the last part of the 19th century—just 100 years ago.

The hydrologic continuum has absorbed these marked but gradual changes in climate, but its integrity has been violently disrupted in some places by, for example, the overpumping of aquifers and the deprivation of the throughflow of sediment because of water withdrawal.

Water withdrawal, storage, and pollution by sediment and wastes will have effects, often adverse, to this continuum, and some are unavoidable. But preservation of the integrity of the continuum ought to be one of the objectives of resource use. As we dry up mountain streams to provide subsidized irrigation water to grow surplus crops, the sediment continues to reach these streams and clog the channels. The exceptional floods will still occur, and, with the channels all but destroyed, will flood over land heretofore above the reach of floodwaters.

The undermining of the integrity of the hydrologic continuum may not be obvious in the four- and six-year election cycles, but the civil servants in the more permanent public agencies might have a longer and larger perspective. It would be salutary if there were developed a guiding principle sufficiently persuasive to be an unwritten but well understood direction—in other words, a public ethos.

The second component of a guiding direction involves another form of balance: equity. In the administration of water programs, one might hope that decisions would reflect a balance among the various claimants, even if the laws or rules do not specify such a need. Although a sense of need for balance may be present, agency personnel are often under great pressure, not only from outside groups having special interests but from supervisors in



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their own agencies. And these supervisors usually are pressured by officials in the administration who derive their authority not from experience in resource management but from one or another political decision.

We see a lopsided allocation of tangible resources, such as water or timber, and a less tangible allocation of preference or advantage. These result in a striking disregard for the public interest and a net loss of national wealth, both monetary and intellectual. Allocation of advantage to the few at the expense of the many persists in spite of the growing alarm over the dangers of shortages, pollution, and the irreversible degradation of the quantity and quality of the water resource, the soil resource, and the biotic resource.

A major problem, as I see it, is the need to muster support for the majority of devoted public servants who perceive the need for a guiding direction, who know that there exists an accumulated lack of fairness, who are powerless to combat it. Here is where science and the professions can help. But, before discussing what steps can be taken to enhance an ethos and fairness, let us examine briefly some results of this lack.

In these examples, it must be kept in mind that, in most instances, Congress itself has set the stage for the excesses, not only by writing legislation favoring one or another special interest but by giving no counteractive instructions to protect the public. Moreover, the public, lacking information and insight, fails to react. But even when reaction begins, it is often after considerable damage has been done to the environment. For example, the public has begun to perceive that maintaining clean air, clean water, and the ozone shield, decreasing acid rain, and controlling carbon dioxide emissions are commonalities that sooner or later are going to be of importance to all people on Earth. Note also that it is the public that is forcing Congress in this direction.

A comparable perception regarding the management of natural resources in the United States has not yet grown to effective levels. Most of Congress, with the exception of a few—such as Senator Albert Gore, Jr., (D-Tenn.) and Congressman George Miller (D-Calif.)—has not yet seen the problem. Let us look at a few of the results of the absence of ethos and equity.

The U.S. Army Corps of Engineers designs and builds works for flood control and navigation, but it also issues permits for alterations in water bodies, marshlands, and estuaries. The Soil Conservation Service, originally a land-management agency, became another engineering organization after World War II. Where earlier policy had been in the hands of agronomists, soil technicians, and range managers, after the war, engineers filled most of the policy-making posts.

One aspect of these engineering programs is the practice of "channel improvement" carried out by both the corps and the Soil Conservation Service. This program of channel straightening has involved 5,000 miles of "improvement" by the corps and 3,200 miles by the Soil Conservation Service. These activities lead to channel instability, readjustment of channel form, downstream effects including bank erosion and bed alteration, aesthetic degradation, and changes in stream biota. These adverse effects have been documented but not to the extent demanded by their seriousness.[7] No studies, research, or practical investigations have been pursued by either the corps or the Soil Conservation Service to examine the downstream effects, the on-site, long-term results, or the ways in which the river channel has reacted to these alterations. Government interest in the long-term future of the landscape is not part of the plan. If the computed but often unrealistic benefit-cost ratio is unity, the bulldozers can rev up. [Editor's note: For more on the corps' water-project policies, see Ann L. Riley's "Overcoming Federal Water Policies: The Wildcat-San Pablo Creeks Case," in the December 1989 issue of *Environment*.]

Despite any theoretical calculation of a benefit-cost ratio, the design of such channel destruction does not include off-site, downstream, or indirect costs. Nor does it include consideration of the nonmonetary yet real effects on the biological and aesthetic systems, which belong to the public or the common. Degradation of the channel system is degradation of the hydrologic continuum.

The Army Corps of Engineers must issue a permit for a development that destroys wetlands or marshlands. In California, more than 90 percent of the original wetlands have been lost to drainage, urbanization, and levee-building. Even in the face of this history, permits to destroy wetlands continue to be issued, usually with some requirement for mitigation—not replacement. In fact, we do not know how to reclaim areas that once were marshlands, and no federal research on how to reclaim lost wetlands is in progress. So—the ex-

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**The Water Resource**
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cuse can be used—we will mitigate this permitted additional loss of wetlands. But mitigation does not create wetland. Mitigation is a euphemistic way to assuage the conscience.

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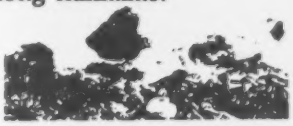


Water development obviously has contributed greatly to the economic and social growth of the country. In the western states, this development primarily has been aimed to promote irrigated agriculture. Most people do not realize that only a small part of the water used in the United States goes to cities and towns. Irrigation uses the overwhelming share. For example, irrigation withdrawals range from 80 percent of the total use in Utah to 90 percent in New Mexico.[8] Furthermore, water use for irrigation is very inefficient. For instance, the U.S. Geological Survey showed that the loss of water by seepage from canals was one-third of the amount actually delivered to irrigated farms.[9]

The excesses, shady deals, and blatant fraud associated with some of the early water development schemes in the western states have been detailed by Marc Reisner in *Cadillac Desert* and more recently by Doris O. Dawdy in *Congress in Its Wisdom*.[10] What is increasingly inexcusable is the persistence of the prodevelopment bias of the U.S. Bureau of Reclamation. This attitude has continued into recent decades of obvious strain on both the quantity and quality of water resources. It is deplorable that the government agency most responsible for managing water in water-short regions continues to be so insensitive to the hydrologic continuum and to equity among claimants.

In the legal battle concerning the water of Mono Lake in California, for example, the Bureau of Reclamation intervened on behalf of the Los Angeles Department of Water and Power. The suit was brought to prevent that department from further lowering the lake by diverting stream flow from the Mono basin to Los Angeles. This is an example of active and unnecessary intervention toward further debasement of the hydrologic continuum. The intervention by the bureau was directed against the public trust doctrine, which has been the basis for some recent court decisions, including the Mono Lake suit. The doctrine leads toward wise management of natural resources.

The Bureau of Reclamation provides water to irrigators at heavily subsidized rates. In addition, from 33 to 45 percent of the acreage irrigated by water provided by the bureau is devoted to production of surplus crops.[11] In 1987, during hearings on H.R. 1443, a bill to eliminate this double subsidy, Congressman George Miller stated that "a farmer with a 960 acre farm receiving water from the Columbia Basin project in the State of Washington will receive a total subsidy in the neighborhood of $4.4 million . . . for a single farm. A single 960 acre farm receiving water from the Central Valley project in my home State of California will receive a total subsidy of $1.8 million."[12]

Another serious inequity is the manner in which the 160-acre limitation has been thwarted. Reclamation law was aimed at supporting the family farm, but, by dividing paper ownership among many individuals, large agribusiness companies can skirt the law; the Bureau of Reclamation looks the other way. Moreover, "when the San Luis Act was passed in June 1960, anticipation of a bright future for small-scale farming ran high. The selling of excess lands, it was said, would create 6,100 farms from the 1,400 ownerships then of record, and provide employment to 26,100 persons on farms and 43,500 'in collateral industries by 1990.' In 1978, 67 percent of the farms were over 320 acres, and . . . 99 percent of the land was tied up in these large farms."[13] In addition, "despite the alleged economic benefits of subsidized water . . . unemployment in these areas has reached persistent, catastrophic levels."[14] For the same area, the Department of Interior reports annual applications of approximately 500,000 pounds of herbicides and 1,400,000 pounds of pesticides.[15]

For many years, the San Luis Drain carried selenium-laden drain water from conduits on 8,000 acres to the Kesterson Reservoir. The poisoning that killed and deformed thousands of waterfowl and aquatic organisms in and around Kesterson Wildlife Refuge is now widely known. But the Bureau of Reclamation had plenty of advance warning that was conveniently disregarded. As early as 1949, the geologist J. D. Love warned that surface seleniferous rocks, actively or potentially poisonous, cover 20 to 30 percent of the area of Montana, Wyoming, Colorado, Utah, northern Arizona, and northern New Mexico.[16]

There is no letup in the demand for more water. The Denver water community wants more diversion and storage to be subtracted from instream flows

and more transmountain diversion. Never is there serious consideration given to the idea of decreasing irrigation use to supply urban needs. This is true despite the fact that most agricultural water grows low-value crops. In California, for example, "nearly one million acres of irrigated pasture require about 4.6 million acre-feet of water per year . . . as much as an urban population of 23 million. Pasture, though it is the single largest water use in California, is an extremely low-value crop, with a gross value of just $94 million (in 1986) in a state economy of $480 billion."[17]

As another example, Glen Canyon Dam on the Colorado River is built upstream of Grand Canyon National Park, which was established not merely for public enjoyment of the canyon landscape, but to preserve the living river. Granted, the generation of hydroelectric power by releases from the reservoir is one of the purposes of the dam, but the resulting rapid changes in river discharge as the gates are opened and closed are gradually destroying the riparian ecology of the Colorado River within the national park. One might suppose that the Bureau of Reclamation, which operates the power plant, would have some consideration for the purpose of and public interest in the park. These include not only the immense recreational demand on the river for float trips, but also the fish, wildlife, and riparian habitat of the channel within the park.

Recently, the Bureau of Reclamation started a program of rewiring the electrical generators so that they will produce more power, but this will be associated with even greater rapid changes in river discharge. The amount and rapidity of discharge is known to be a major element in the erosion of sandbars in the canyon and in the destruction of the riparian zone. These changes in discharge cause the river level to rise or fall many feet in an hour.

This increase in water-level fluctuation has caused great concern in the National Park Service and, of course, among recreational users of the river. The response of the bureau has been to initiate some studies, but there is no indication that they intend to alter any operational program to help a sister agency.

Special-interest bias and short-term outlook are not limited to the government agencies developing and selling water, changing the flow of rivers, and altering stream channels. They can also be seen in some of the other resource agencies.

The U.S. Forest Service fervently wishes to be considered the protector of the public interest in the administration of national forests. It should be no surprise to its administrators that the general public, unconnected with forest-product industries, pictures the Forest Service as overseeing the elimination of ancient forest, selling publicly owned timber resources at a loss, constructing roads in presently roadless areas so they cannot be considered for wilderness designation, and promoting oil and gas development in the face of environmental degradation. "The conifer forests of the Pacific Northwest contain the largest stands of temperate, old-growth rain forest south of Alaska. These stands are being liquidated faster than the tropical rain forest of South America. At least 85 percent of the Pacific Northwest's old-growth forests have been eliminated, compared to 40 percent of the world's tropical rain forests and 15 percent of the Amazon's."[18]

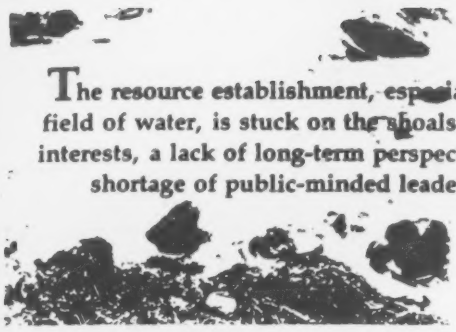
While the United States continues to import a significant portion of its wood products, an important part of the annual cut from national forests has been shipped to other countries. In a 1989 decision, U.S. District Judge William Dwyer said: "Statistics show that in the last ten years more than 30 billion board feet of raw logs . . . have been exported from Washington and Oregon to foreign markets, primarily Japan."[19] Compare this figure with the 2.6 billion board feet that constituted the total cut in the year 1949 from the entire national forest system coast to coast.[20]

Declining lumber mill employment is a result of the fact that "one in every four logs cut in the Northwest is shipped overseas. Most are purchased in Japan, Korea, and other Asian nations that are willing to spend twice what domestic mills will pay for unprocessed logs. Consequently, the largest United States timber companies are posting record profits by exporting raw logs—and thousands of mill jobs."[21]

There are officers within the Forest Service who cry out for a long-term ecological policy. Hal Salwasser, a deputy director of wildlife and fisheries for the Forest Service, put it this way: "Because it will not be possible to protect much of the variety of life in the strictest nature reserves, the multiple-use of public lands and semi-natural areas . . . will be crucial. That means stewardship, sustainability and recovery."[22] Notice the word sustainability is used again, this time by a government officer. Jeff DeBonis, a national forest timber sale planner, wrote to the chief of the Forest Service as follows: "[We in the Forest Service must] have the courage to aggressively move our agency away from the political expediency of the past in our alignment with the resource extraction industries. . . . [We must] forge a new resource ethic by publicly endorsing our alignment with the world-wide environmental community, aggressively endorse the search for a sustainable future, and demand an attitude change to move our agency away from its current perception that the environmental community is the 'enemy' in 'getting our job done.' "[23]

The Forest Service advertises its dedication to multiple use, but its research gives no assurance that its policy of clear cutting followed by monoculture will result in sustainability. Present practice throughout all the national forests is to clear cut the timber and then plant a single species of tree or depend on regeneration of a dominant species. In the forests I know personally in Wyoming, clear cutting is followed by hand-planting seedlings of lodgepole pine. We are told that, in 120 years, these seedlings will develop into merchantable trees 9 inches in diameter.

The monoculture of planted spruce in Germany resulted in an ecological desert devoid of birds and insects and with no soil development. According to biologist Chris Maser, no forest in the



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world can survive logging more than three generations. "In western Europe and Scandinavia, where the tree plantations are over 200 years old, trees have almost stopped growing. Normally replenished by rotting logs, the soil has simply worn out."[24]

To my knowledge, no Forest Service research is aimed at evaluating over the long-term the effect of changing a multistoried, mixed-species stand to an even-aged, single-species forest. The Forest Service's attitude is to let the people 120 years from now worry about the results of this present ubiquitous policy of forest management. There is a bland assumption that present policies are sufficient to maintain the integrity of the ecological and hydrological system. But the extensive and competent research establishment of the Forest Service is so separated from the operational needs of the organization that important questions concerning the long-term effects of present policies are not being addressed.

Thus, in the Forest Service, one of the key resource agencies of the federal government, the current policies appear to be importantly driven mostly by demands of the extractive industries with no part of the program devoted to assessing the long-term results of these policies. The Forest Service is required by law to have a monitoring program to make just such assessments, but the required monitoring is given short shrift. It is the stated policy in one forest headquarters I know that they can clear cut 50 percent of the forested area of a basin with no adverse effects on the water quality or the stream channels. However, there has been no attempt to make measurements to test the validity of this assumption.

The resource establishment, especially in the field of water, is stuck on the shoals of special interests, a lack of long-term perspective, and a shortage of public-minded leadership. The resource base of the nation is being washed downhill, sold for less than its real value, exported to foreign countries, and needlessly degraded in aesthetic quality. This is occurring while there is a worldwide awakening and concern for nature. The leading spokesmen for the environmental cause are heard not in Washington, D.C., but in Montreal, Stockholm, Paris, Geneva, Ottawa, and, interestingly, Moscow. These voices are asking for what Congressman Ronald Dellums (D-Calif.) calls an ethical pragmatism, as yet unheeded by most of our leadership. However, there are some encouraging signs that perhaps a new outlook can be developed:

- Some senior officials in the Washington, D.C., office of the Forest Service are trying to develop a program dedicated to the preservation of ecological balance and continuum. Some national forest supervisors are leading the way to new concepts of forest management; the Carson Forest in New Mexico and the Nez Perce Forest in Idaho are examples.
- There are environmental technical officers in the Army Corps of Engineers who are gradually influencing the thinking in that agency.
- The Bureau of Reclamation is attempting to find a new purpose including the protection, restoration, and enhancement of water quality and the environment.[25] Unfortunately, this is not being received with enthusiasm in the field offices. The attitude of some of the bureau personnel regarding this restructuring does not give any basis for optimism.[26]

Specific suggestions for alterations in legal definitions and administrative procedures of resource agencies include reforming the classic doctrine of appropriation, developing comprehensive watershed resource planning, enunciating substantive policy objectives, and reforming legislation.[27] Water transfers represent one of the most important, useful, and practical ways to improve efficiency and equity.[28] Recognition in some court cases of the public trust doctrine in water law is the single strongest statement that historic uses must accommodate modern needs.

To carry out such reforms, William Ruckelshaus, a former administrator of the U.S. Environmental Protection Agency, said: "In creating the consciousness of advanced sustainability, we shall have to redefine our concepts of political and economic feasibility. These concepts are, after all, simply human constructs."[29] It is this very idea on which I wish to concentrate attention. In practical terms, how do we begin to "redefine our concepts of political and economic feasibility"? By far the most efficient way to begin would be to have leadership coming from the White House. But action and inaction on environmental matters at the top levels have been mixed. With the exception of leadership posts in the Environmental Protection Agency and the Fish and Wildlife Service, the appointments made or proposed by the present administration are not ones that are going to provide leadership in the environ-

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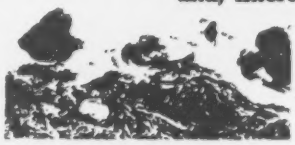

mental field. The administration is certainly not oriented toward the environment. Whether some leaders in Congress can move us in that direction depends on whether public interest and concern can be mobilized.

Even without such high-level help, a very large step can be taken by a reorientation within the resource agencies. A new direction should be guided by an expressed ethos involving the long-term health of the ecosystem and a new pledge for equity. Such a change does not need new legislation, does not depend on legislative reform, nor does it need new money.

Such a change is actually possible. Even though the extractive industries denounce the new environmentalism, concern for the health of the planet is beginning to reach the public mind. A subtle and, no doubt, difficult metamorphosis is necessary to bring these alterations to reality. This more elementary part of the job might well begin with the scientific community and the professions, which apparently must provide the key elements needed—the scientific underpinnings supporting the need for action and the need for a better-informed public. The global warming debate shows that a role in mobilizing public opinion can be played effectively by the scientific community.

In a recent speech, John A. Focht, Jr., President of the American Society of Civil Engineers, said he had selected four areas of emphasis for the society, one of which is "participation in public policy development; i.e., engineering involvement in societal issues."[30] The field of resource management is in need of that concern. The professional societies have, in many instances, provided much-needed technical overviews that have influenced policy. In the water-resources field, an example is the compilation of a handbook on sedimentation by the American Society of Civil Engineers. This handbook required work by a committee of distinguished engineers and many subgroups that lasted over a period of years. Besides the elucidation of technical details, the work brought into public view the importance of sedimentology to a variety of engineering projects.

Apart from purely technical aspects of engineering, the water management field is ripe for a wide-ranging discussion of engineering practices. There are concerns regarding the narrow scope of graduate education, ethics in professional practice—especially in regard to litigation—and the matters referred to earlier concerning intellectual freedom in agencies of government. In such matters, it may be useful to expand the society's Committee on Ethics initiated by Daniel W. Mead in the 1930s. As a Fellow and Life Member of the American Society of Civil Engineers, I feel I can call on the president of the society to explore how his pledge to be involved in public policy development can be applied to water management.

The technical aspects of resource policy need discussion both by the professional groups and by the scientific organizations, such as the American Geophysical Union (AGU) and the American Water Resources Association (AWRA). For example, it would be useful to organize a series of technical sessions dealing with the processes, physical effects, and probable future results of preient policies of water-related agencies. I have already mentioned the program of river improvement by dragline and bulldozer about which little scientific analysis has been done. The ecological and pedological effects of continued monoculture is a technical subject with policy implications. A discussion of such management policies—not dissimilar to the recent successful series on the history of hydrology—is within the compass of scientists of AGU and AWRA.

What is the role of science in facing problems of ethos and equity? What might be the role of the National Academy of Sciences and the National Research Council (NRC) and its committees, such as the Water Science and Technology Board? A principal function of the Academy is to provide advice to the government. Most studies conducted and reports prepared by NRC committees are of a technical nature, but many committees and boards are specifically authorized or instructed to discuss and analyze issues of public policy. Often such policy issues relate directly or indirectly to available scientific knowledge and the need for further facts and understanding, but, in many cases, the items of importance are the policies and management practices themselves.

Policy and management decisions made by resource agencies have direct effects on various groups: logging and mining interests, agriculturalists using water, contractors and suppliers of machinery and fertilizers, recreationists, to name a few. Therefore, the details of policy and management are often contentious.

Agencies that manage natural resources desperately need objective analysis and advice from independent organizations such as NRC. But experi-

ence has shown that many NRC committees are not comfortable with contentious issues. As a result, NRC's effectiveness is diluted by committees that do not want to expend the effort needed to delve into tough issues.

Even when advice is requested of the Academy and is given, one can ask what government agencies do with the advice. There are instances when it appears that an agency requests advice from the Academy in order to increase credibility but without any serious intention of acting on the advice received. In such a case, the Academy appears to be used as a mere tool.

The National Research Council might well consider how it can help its committees manage the discussion of contentious issues. Some suggestions are worthy of consideration. For instance, it is often stated with pride that NRC has well over a thousand committees, boards, study groups, and panels. In the few fields in which I have some knowledge, it appears that many of these entities are studying issues of minor importance or ones that might well be done by consulting firms. An argument might be made that there should be fewer such committees working on more carefully screened topics. That some agency is willing to finance a study does not guarantee that it is worthy of NRC attention.

The majority of NRC committees and units are financed by agencies or bodies not related to the Academy. As a result, however, some subjects of vital importance to the sustainability of the national well-being get no attention. I strongly commend the president and the council of the Academy for their effort to increase its endowment. I hope that the greater flexibility that the endowment will permit means that the Academy, of its own volition, will take up matters of importance that heretofore have not been financed.

Further, there is a need, in my opinion, for NRC units to insist on a broader scope of inquiry than might originally be suggested by an agency request. Let me give some examples within the water-resources field.

The Water Science and Technology Board has a Committee on Irrigation-Induced Water Quality Problems. The selenium in Kesterson Marsh is central to that problem. But the committee has struggled to maintain within its purview any inquiry into the policies or management decisions that led up to the serious situation that now exists. It is not clear at the present time whether the committee will have any influence on the broader policy issues that lie at the root of the problem.

Under the same board is a Committee on Glen Canyon Environmental Studies. This very useful committee has assisted in setting priorities with respect to work plans for study of the effects of reservoir operation on the ecology and physical health of the Grand Canyon channel. Although the committee does not have within its scope any inquiry into the reservoir operation that is causing the degradation downstream, it has constantly pressed the Glen Canyon Environmental Studies research team and the Bureau of Reclamation to consider changes in reservoir operations to minimize the degradation. So, the study group may recommend studies of the degradation but is precluded from considering the basic cause of the problem.

Also under the board, there recently was organized a Committee on Restoration of Aquatic Systems. At the time this came under consideration, I argued that such a committee should include in its deliberations discussion of the policies and practices of government agencies whose actions have led to the destruction of aquatic systems and, thus, the necessity for restoration.

In the choice of subjects for study and in the instructions for carrying out the tasks, the Academy's oversight must be intensified, improved, and made more incisive. The professional societies as well can play a greater role in bringing to the public the information and analyses regarding policy issues involving resource management. Of course, both the professional societies and the Academy can support and increase the stature and professional status of civil servants in the resource agencies by encouraging them and by putting good information in their hands.

The natural resources of the United States are a key aspect of the growing world competition. Their management is not guided by any ethos of long-term sustainability. Instead, management is stressed by a plague of special interests and a disdain for equity. As a result, the public is the continual loser.

It is not far-fetched to look back in history. When I do, I have the deeply disturbing thought that, absent a basic metamorphosis, we are presently rigging our ships for the voyage to Syracuse.

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# WATER MANAGEMENT

By Warren Viessman, Jr.

Heretofore, the United States has been a leader in designing and applying state-of-the-art methods to identify, understand, and deal with an array of water management issues. But yesterday's policies are inadequate for dealing with today's problems, and new, more sophisticated strategies must be employed to meet the challenge of the future. Action is needed now to ensure that water resources that have escaped human manipulation are protected and that those that have been despoiled are restored to a cleaner state. If no action is taken, it is unlikely that future generations will enjoy an enviable quality of life.

During the last 40 years, there have been many attempts to reshape U.S. water policy.[1] In 1961, the Senate Select Committee on Water Resources released a report that led to passage of the Water Resources Research Act of 1964 and the Water Resources Planning Act of 1965.[2] These acts, often thought of as the starting point of a new era in water management, provided a national focus on water-resources research and planning.

The planning act set up the U.S. Water Resources Council; encouraged a comprehensive, coordinated federal attitude toward water-resources management; and served as the foundation for states' efforts to begin or expand water-resources planning.[3] While the planning act initiated a comprehensive assessment of U.S. water resources and options for dealing with water-related problems, the research act established a Federal Office of Water Resources and Technology and a water-resources research institute in each state to address water management issues.

Shortly thereafter, the National Environmental Policy Act of 1969 and the Federal Water Pollution Control Act Amendments of 1972 (better known as the Clean Water Act) profoundly changed the emphasis of federal funding and effort from traditional water-resources development, such as dam and canal construction, to environmental protection and restoration.[4] The acts also increased states' efforts in comprehensive water management and introduced a legal requirement that environmental impacts be addressed in the planning, design, and construction of water projects.

In 1973, the National Water Commission, created by Congress in 1968 to review national water-resources problems, released the landmark report "Water Policies for the Future,"[5] which further emphasized the need for clean water and environmental protection rather than just water supply. The report endorsed a "user pays" principle and supported the elimination of federal subsidies for water-resources projects and programs. President Carter's 1978 water policy initiatives called for improvements in water-resources planning and management, construction of only cost-efficient water projects, increased attention to water conservation, improved cooperation between federal and state agencies, and greater focus on environmental quality.[6] When the Reagan administration took office in 1981, it supported transferring responsibility for many water programs to the states, sought to increase nonfederal cost sharing of water projects, and

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encouraged full recovery of expenditures for water projects. The Reagan administration also terminated the Water Resources Council, an action that signaled the end, at least for the time being, of the only umbrella water-resources planning effort in the federal government.

Passage of the Water Resources Development Act of 1986 culminated years of effort by the Carter and Reagan administrations to require greater levels of nonfederal cost sharing for water projects and programs.[7] This act increased the likelihood that states would be more discriminating in pursuing water projects and ensured that states would play a greater role in solving their long-term water supply and quality-control needs.

Today, water management policies no longer focus solely on development. Nonstructural measures, such as land-use modifications and regulations, to solve water problems are favored. Society's attitudes about the value and use of water are changing, especially about what constitutes a beneficial use of water resources. Finally, public perception is becoming more solidly embedded in policy-designing processes.

## Issues and Answers

Few would deny that progress has been made in water management, but many concerns remain for which new or revamped water management policies are urgently needed. Not all of these issues directly confront the United States, but their spillover effects make them U.S. problems as well. The issues include

- burgeoning populations, especially in Asia and Africa;
- poverty, with more than 1 billion people living under squalid conditions worldwide;
- daily deaths of thousands of children from avoidable water-borne diseases;
- destruction of forests, wetlands, and croplands;
- depletion of natural resources;
- injurious land development and management practices;
- solid waste disposal;
- acid precipitation's effects on lakes, forests, and structures;
- contaminated drinking water (of those residing in developing nations, about two-thirds do not have access to safe drinking water);
- ocean disposal of threatening substances;
- offshore developments, including oil drilling;
- nonpoint-source pollution; and
- natural disasters such as volcanic eruptions, earthquakes, floods, and droughts.

Furthermore, an array of institutional elements that impede the design and implementation of needed water policies must be dealt with. Such elements include obsolete laws and regulations, water allocation policies that breed wastefulness, subsidies that encourage inefficient operations, lack of funds, and incompetence.

What can be done to address these issues? The options are many. The United States needs a better informed and educated public; modernized institutions; adequate resources; improved planning and forecasting capabilities; unified land and water management policies; united technology and public policy; improved understanding and handling of risk; and the right forums for problem solving. If the people elect informed, dedicated leaders, demand responsible and timely action, and work at overcoming parochialism, there is hope indeed that sufficient good water can be made widely available. (For more on U.S. water policy see "Ethos, Equity, and the Water Resource," by Luna B. Leopold in the March 1990 issue of *Environment*.)

**Few would deny that progress has been made in water management, but many concerns remain for which new or revamped water management policies are urgently needed.**

### *Public Information and Education*

Public education is a critical element in shaping the direction of water policy. The better acquainted with environmental issues citizens are, the more likely they are to demand environmentally sound decisions from their elected officials. Members of decisionmaking bodies must become more conversant with the water-environmental agenda, its roots, and its links to other programs of concern.

To educate future officials and the electorate, water-environment issues should be introduced directly into school curricula for all grades, and more emphasis should be placed on environmental issues in adult, public, and professional educational programs. College curricula should embrace the

legal, social, political, technical, and economic dimensions of water-environment issues. Environmental problems cannot be adequately addressed within narrow disciplinary boundaries; the interdependencies of actions and processes must be considered.

Education plays an important part in overcoming the "not-in-my-back-yard," or NIMBY, syndrome. Problems associated with water quality, in particular, are compounded by the blocking actions of people who may be in agreement with the need to solve a problem but do not want it solved in their locality. This attitude encourages continued malpractices and delays even incremental improvements.

Progress is being made in teaching citizens to protect the Earth and in bringing about a more environmentally conscious electorate. For example, in 1983, members of the Texas Society of Professional Engineers became convinced that an informed citizenry was a prerequisite to solving the state's water problems.[8] These far-sighted leaders saw the value of incorporating information on water resources in the curricula of elementary and secondary schools. They believed that, through the students, the benefits would extend to their parents as well. Texas now requires that subject matter on water issues be included in targeted school textbooks.

*Modernizing Institutions*

Institutions affecting water management include special-interest groups, government agencies, statutes, laws, regulations, and social customs. Many of them are relics: Technological development proceeds at a breathtaking pace while institutional reform crawls. Water and environmental management are impeded by an array of institutional constraints, and the institutional reforms that have been implemented to deal with them are few.

Bringing about institutional change can be tedious and painful. Laws, social customs, and the traditions and philosophies of agencies are deeply entrenched and resist modification. Nevertheless, by objectively exploring alternative ways of solving problems and managing systems, by identifying the pros and cons of implementing various options, and by articulating the payoffs that could result from change, reforms can be effected. In some cases, consolidating functions and reallocating agency responsibilities may be required; in others, legislative action may be needed to amend or rescind outdated statutes. But to do so, hard-hitting campaigns to convince legislators of the efficacy of the proposed changes will be required.

The roles of the federal and state water agencies require thorough and continuing analysis. The change in program emphasis from irrigation development to water-resources management, which was announced by the U.S. Bureau of Reclamation in 1987, is consistent with this recommendation.[9] But it is not enough to say that changes will be made; the machinery for making changes must be solidly in place, and the changes must be more than a justification for renewed funding of a well-entrenched bureaucracy. Even stepwise improvements, such as amendments to the Clean Water Act, can be beneficial, and such options should not be overlooked in pursuit of quick, massive reforms.

Improvements in coordination and consistency among governments and agencies are needed.[10] Links between state and local governments are usually weak, and the same may be said of those between state and federal governments.[11] State officials often view water management only from an allocation perspective, while local governments commonly focus on such issues as storm drainage and wastewater treatment. Where regional planning and management overlap those of other jurisdictions, the problems of coordination and consistency are exacerbated. Implementing plans in such a setting is particularly difficult, especially when governmental subunits or agencies are at odds. What is considered best at one regulatory level is not necessarily best at another, and plans should be developed in recognition of these differences. Thus, planners and managers should be sensitive to the impacts their proposals may have on other government agencies.

The problems associated with fragmented authority and lack of coordination are illustrated by the difficulties encountered in sustaining barge traffic on the Mississippi River during the 1988 drought.[12] Requests to the Army Corps of Engineers to release additional flows from the Great Lakes system raised the question of who had the authority to make such a decision because the responsibility for the vast water resources in question was fragmented among 18 federal agencies and several states. There is no coherent federal water policy for allocating water, even under extreme emergency condi-

**College curricula should embrace the legal, social, political, technical, and economic dimensions of water-environment issues.**

tions.[13] Furthermore, as of 1989, only about 15 states had completed sound drought management plans.

Since the demise of the U.S. Water Resources Council in 1982, there has been no federal body overseeing water policy and management. This vacuum needs filling. The council, although flawed, provided a forum for a state-federal partnership that no longer exists. The council recognized the special problems associated with protecting natural systems and was creating an ethic of more reasoned and conservative water use. Above all, the council, unlike more parochial agencies, addressed water issues at a nationwide level.

Some type of national council or water board is urgently needed to guide the design of federal water policy; coordinate federal water programs and agencies; assess the status of U.S. waters, forecast future water supply and demand scenarios; facilitate water research; provide guidance and support to state water planning and management programs; and explore the implications of emerging global problems for water quality and supply. While the value of such an institution may be recognized in certain quarters, the turf-protecting attitude of many members of Congress and the administration stands in its way.

Workable regional, international, and global water management institutions also must be designed and put into operation. Cities, counties, states, and even nations often are too limited in jurisdiction to deal appropriately with water-environment issues.[14] More often than not, local water problems have regional, if not global, dimensions and must be dealt with in that context. A broad understanding of the functioning of entire ecosystems must become the basis for unified action. The responding institutions could range from regional authorities with broad powers to international cooperative agreements among nations. The Florida Water Management Districts, the Nebraska Natural Resource Districts, and the British Water Authorities are examples of effective regional institutions.[15]

### *Accepting and Paying The Bill*

Too many U.S. citizens still believe that water should be free and that they should be able to use it in any way they see fit. This belief has resulted in government subsidies for some water-using sectors and a backlog of decaying infrastructures in others because many water developments raise insufficient revenue to pay for their own maintenance. The belief also has encouraged inefficient water use, generated excessive capital outlays for both water supply and wastewater works, and fostered policies that generate, rather than manage, growth in water use and development. If U.S. waters are to be managed to meet future needs, the public will have to begin paying for maintenance and accept a "user pays" system instead of increasing federal subsidies. Hence, questions concerning the costs of various water management options and who will benefit from implementing them must be raised.

A particularly troublesome issue demanding increased research and analysis is that of quantifying the values of the environmental benefits associated with various water management proposals. Both the costs and benefits of a water project can be high, and they must be made clear to decisionmaking bodies.

Sources of funds for water projects and economic incentives and disincentives must also be considered. With federal funding cutbacks, state and local governments are bearing an increasingly larger share of project costs. The cutbacks could lead to greater efficiencies and more imaginative approaches to water management, but, at the same time, new and innovative financing mechanisms will have to be developed. For instance, payment for water management facilities and services could be made through capital budgeting, user fees, utility fees, taxes, impact fees, and full-cost pricing.

One interesting and unusual financing mechanism has been used by Florida's Save Our Rivers program (SOR), which was initiated in 1981 to protect Florida's natural waterways, wetlands, and drinking water. The program is designed to remove ecologically fragile river-basin lands from private ownership so that they can be managed in a manner that maximizes their utility for water supply while conserving and protecting water resources. SOR is financed with a documentary stamp tax placed on all real-estate transactions in Florida. Fifty cents is collected on each $100 worth of property sold, and five cents goes directly to the Water Management Lands Trust Fund for SOR.

Water management is a case in point for the need to reshape national priorities and reallocate social assets.[16] Additional water management initiatives

**If U.S. waters are to be managed to meet future needs, the public will have to begin paying for maintenance and accept a "user pays" system instead of increasing federal subsidies.**

cannot be funded when there is no new money. Resources must be shifted from areas of excess indulgence to those in need, such as the water environment.

*Planning and Forecasting*

Water management plans must be proactive, rather than reactive, and designed to guide water-resources policymaking.[17] Traditional planning processes too often fail to come to closure, are weakly linked to implementation processes, lack coordination with the affected public, and do not embrace all dimensions of the issues on which they focus. As a result, water management decisions frequently are passed to regulators and the courts, which rarely have the expertise to prescribe appropriate courses of action.[18]

To assert the proper role of water-resources planning, planners will need to adjust their plan definitions and philosophies and garner support from legislative bodies, implementing agencies, and the public. Because water management is heavily regulated, it is crucial that regulatory requirements be the result of carefully devised policies. A model planning process should

- recognize and address society's goals;
- identify and deal with the important problems and conflicts;
- function effectively within prevailing legal and institutional frameworks;
- accommodate both short- and long-range scenarios;
- generate diverse alternatives;
- take into account the allocation of water for all needs, including those of natural systems;
- embrace public input as a basic part of the planning;
- take a global perspective;
- be flexible and adaptable;
- drive regulatory processes;
- be the basis for policymaking;
- foster coordination among planning partners and consistency among related plans; and
- produce viable recommendations.

Unfortunately, the adoption of such a process has been hampered by the separation of planning and implementing authorities, a pervasive tendency toward turf protection, inadequate and poorly paid planning staffs, shortsighted efforts, lack of objectivity, poor understanding of the planning role, and limited funds. The states, in particular, have been deficient in their ability to sustain comprehensive water-resources planning.

*Coordinating Land and Water Use*

Land use and water use are inseparable. What people do to land affects the connected water resources. Policies for land and water management should, therefore, be consistent and coordinated. Yet the scientific community in the United States adheres to reductionism and tends to resist holistic approaches.[19] The long-standing tradition of dealing independently with land, water, and air resources has been a major contributor to the degradation of natural and developed areas. Concerns about water, land, plants, animals, fish, and humans are best dealt with collectively.

The inextricability of land and water problems underscores the need for coordinating water-resources planning and management with land-use planning and regulation. This need has long been recognized, but overcoming the institutional barriers to such coordination has been a slow process at best.[20] A large obstacle is local governments' fear of losing their control over land use. Clearly, the key to coordinated land and water management must be found. One promising model is Florida's state planning system, which requires that state, regional, and local government plans for everything from public education to land use be consistent. Florida's system mandates that decisions concerning water resources in local government comprehensive plans conform with broader state and regional water management policies. The system has only been in effect for a few years, but it shows promise of providing a workable land and water planning forum.

**The long-standing tradition of dealing independently with land, water, and air resources has been a major contributor to the degradation of natural and developed areas.**

*Managing Risk*

One of the most troublesome issues facing water-use policymakers—and environmental policymakers in general—is risk management.[21] There are problems surrounding the quantification of risk, the perception of risk, and the assessment of acceptable risk by society. Many individuals press for endless regulations as if they could regulate a zero-risk world. Yet these same people accept a variety of risks every day. Some people voluntarily expose themselves to certain risks, such as smoking,

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while they consider other, nonvoluntary risks, such as exposure to drinking water that may contain trace contaminants, to be unacceptable.

There is a great need for good risk communication and for education, not only for those who perceive the danger, but also for those who understand the likelihood of the danger. Scientists often are unable to communicate adequately with the public about risk and leave the policymaker to make judgments about risk in an arena of uncertainty and public fear. Where risk and uncertainty are issues, the costs of reducing risk must be clearly articulated, as must be the benefits of accepting various levels of risk, and the public must be included in policy design.

Finally, there must be a move toward developing water quality standards that reflect technological feasibility rather than arcane estimates of potential health hazards.[22] It is better to get on with the best protection that can be provided than to delay action while arguing about contaminant levels and their effects, which cannot always be substantiated. (For a lengthier discussion, see "Opening Doors: Making Risk Communication Agency Reality," by Caron Chess and Billie Jo Hance in the June 1989 issue of *Environment*.)

*Providing a Forum*

Water policies that maximize efficiency and effectively address citizens' views can only be developed in the proper forums. In some cases, existing city councils, state legislatures, and public-interest committees are adequate. Numerous occasions and issues, however, require nontraditional approaches. In general, two classes of needs are apparent: those related to resolving or avoiding conflicts (garnering consent) and those related to solving problems that transcend normal political or bureaucratic boundaries. Forums for garnering consent are needed to address points of contention, while forums for breaking down traditional boundaries are needed to analyze issues in their proper contexts. Historically, such forums have been extremely rare, but now they are increasingly being designed and applied for planning and management purposes.[23]

Water-resource protection, development, and management must be designed to address potential conflicts and incorporate mechanisms for dealing with them that have a high probability of being accepted by all the people who have a stake in the issue.[24] To deal effectively with conflicting interests, the principal stake-holders must be brought together in an atmosphere that encourages cooperation and an exchange of views. Building consent among the affected parties—whose consent is necessary to formulate an acceptable action—and identifying common ground should be the objective. To get those parties to the table and keep them there until an agreement is reached, the stakes must be high; each party must have a lot to lose and know it, so that leaving the negotiation table is more painful than staying.[25] The key is to establish negotiation, rather than litigation, as the vehicle for resolving conflicts and designing acceptable alternative courses of action.

Such a process led to passage of Arizona's far-reaching Ground Water Management Act of 1980.[26] Representatives of the mining industry, agriculture, and cities were brought together in a forum designed to keep them there until a solution emerged. It was clear that each party could lose a lot by not participating. The result was a state-of-the-art strategy to bring water supply and use into balance.

Analyses of how conflicts have been dealt with in the past—if adequately documented—could be effective instructional vehicles. University and professional curricula related to environmental problem solving would do well to address fully such subjects as consent building, decisionmaking processes, working with the public and governmental bodies, and policy analysis. Furthermore, scientific and engineering expertise must be more effectively introduced into conflict-resolving arenas. Otherwise, the resolutions may be technologically deficient.

System-encompassing forums are needed to address situations where political subdivisions are too small to deal comprehensively with resource management problems and where the facilities or missions of several agencies are involved. For example, "local" water problems are often regional in scale and, when analyzed in that context, yield ef-

**Analyses of how conflicts have been dealt with in the past—if adequately documented—could be effective instructional vehicles.**

ficient solutions that otherwise might not be identified.[27]

Such an approach was applied in the Washington, D.C., metropolitan area, where a protocol was devised to manage all elements of the water supply system in concert, irrespective of ownership.[28] The protocol resulted in an ability to improve water supply during periods of drought without building major new supply projects. The savings in costs over more traditional plans was about $250 million. The success in Washington, D.C., demonstrated that such forums can result in substantial gains and special regional reforms.

A similar approach might be successful in the North Platte River basin, where it has been estimated that water shortages might be cut by 50 percent or more if the system were operated to meet demands rather than to conform to prevailing water-rights policies.[29] And studies of the Houston area water supply have shown that coordinated operation of independent facilities could result in increased safe yields of almost 19 percent.[30] (A safe yield is the maximum amount of water that can be continuously diverted from a body of water during a drought.) In such cases, regional organizations like those mentioned earlier could provide expansive forums needed to formulate effective policies.

Unfortunately, the benefits that could be achieved by integrating the management of water resources are underappreciated. In most river basins, there is no single agency or individual who controls all of the components of the water management system. To overcome this problem, joint and coordinated decisionmaking and comprehensive system-wide analyses are required. Institutions responsible for investigating the integrated management of water systems must be designed and funded. The economic and environmental payoffs from establishing objective, system-encompassing forums could be staggering.

### *Understanding Natural Systems*

The U.S. public is becoming increasingly concerned about protecting, enhancing, and restoring natural systems.[31] However, the scientific knowledge needed to improve human understanding of these systems in the balance of nature is limited. Accordingly, there is an urgency associated with elucidating ecological principles.

The economic and social effects of decisions regarding natural systems can be far-reaching. Economic development and environmental protection can be partners, but only if care is exercised in modifying the landscape. Growth management policies that embrace the many dimensions associated with managing natural systems are badly needed.

Expanded research and monitoring programs must be supported. Most studies of environmental water requirements have dealt with flowing streams. Much less has been done to determine the water needs of wetlands, wildlife habitats, freshwater-saltwater interface zones, and other natural systems. There is a similar lack of knowledge for establishing the value of water in natural systems. Wetlands, for example, may not generate the emotional excitement of national parks or wildlife preserves, but their ecological significance is considerably greater, and their protection, enhancement, and use must become a major factor in water management policy.

Finally, there is the question of who will champion the cause of water allocation for natural systems. Consider allocating a water supply among competing agricultural, industrial, municipal, and environmental sectors. In a marketplace setting, the one with the greatest ability to pay will win. How can environmental uses compete in such an arena? In the final analysis, the public, which means the government, must ensure that the necessary monitoring, research, education, funding, and policymaking occur. Only informed governmental intervention will work, but, for such intervention to give full weight to environmental concerns, federal, state, and local governments must have a strong mandate from the people to safeguard the environment.

## Preparing for the Future

In general, progress in dealing with the above issues has been slow or nonexistent. The U.S. government and public have been slow to correlate public education with improvements in decisionmaking and remain deeply entrenched in existing methods and approaches. The public is rarely involved in developing water management plans, which too often become mired in intergovernmental and interagency turf battles. Problem solving is constrained by the nonconformance of political and hydrological boundaries, and the public is unwilling to recognize and pay appropriately for the development and use of water. Most problem-solving forums are overly focused on today's crises, unexcited about dealing with the future, and unprepared to stave off conflicts.

Water policies of the future must take on broad dimensions.[32] Proactive planning must be implemented, with more emphasis on regional planning and management. The days of managing water resources parochially must cease. Water management, coordinated with land management, must be practiced at and among all levels of government. Policymakers and planners must take preventive rather than remedial approaches to solving the mounting problems of the U.S. water environment.

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Senator HATFIELD. Thank you, Ms. Frenkel. I gather that you then support the thrust of this effort today as embodied in 1996 and we look forward to working with you in the refining of this bill.

As you know, a number of the organizations, particularly the National Wildlife Federation, have opposed the recent water development projects such as on the Colorado River. Now, as we have began to resolve the treaty rights with the Indian nations and they increasingly urge for the development of infrastructures to be able to implement and use their treaty rights to these waters such as the Umatilla project, how would the Sierra Club balance these water projects from an environmental point of view with the treaty rights that we have to deal with, of course, with the Indian people?

Ms. FRENKEL. You probably already gave us the answer, which I think it takes it out of the realm of what we choose or what we do not choose. And that is the fact that in a sense, we must treat treaty rights as law. And as long as those exist, we, of course, cannot ignore that. One of the traps that environmental organizations often wind up, in terms of any given project or any given situation, is saying you are for or against this particular project or this particular change. This is one of the reasons that, as a matter of fact, we have rather carefully written our testimony to give some standards by which we think one should begin to look at changes in whether we are talking about water law or water use, water management.

These standards of equity, sustainability of a resource, et cetera are going to be very high on our list. And we will probably be saying this over and over and over again. In establishing a comprehensive policy, it is paramount that none of these factors such as Indian treaty rights, Federal reserve water rights, wetlands protection—all of these are part of this. But probably balancing means you are going to have to say none of this is some of that. And maybe we need to be looking at the process, not just at who wins and who loses, but what is the overall goal you have for your policy.

Senator HATFIELD. You do recognize the superior rights under treaty that the Indians might claim that we may not, in each and every case, be able to apply that same criteria to treaty rights?

Ms. FRENKEL. True. But, by golly, I think you ought to try.

Senator HATFIELD. I am not suggesting that there be any less effort to try to do that, but I am just saying——

Ms. FRENKEL. There are limitations, of course.

Senator HATFIELD. I know there was an acquiescence without enthusiastic support for the Umatilla project. And I assume that that was sort of a precedent that you recognized where you might oppose that project under other circumstances, that you refrain from opposition because of the superior treaty right that the Umatillas enjoy as far as claiming their water.

Ms. FRENKEL. That is right.

Senator HATFIELD. These are some of the interesting little nuances that we have to deal with.

Well, I personally feel that it has been very beneficial in terms of holding this hearing and receiving this very informative and abnormally high quality of testimony from all groups today. If I were to

try to summarize some of the common threads that came through to me, I would say that there is an expression of fair consistency that the States must have a significant role as partnership in the development of a comprehensive plan and implementation of that plan. It seems to me that we also got some very significant testimony from the Federal agencies particularly that we have reached the point of water use that we should recognize already constitutes a crisis in terms of increasing escalating demand and the supply. So we cannot put off that which we have succeeded in putting off for so many years facing up to this particular issue.

And it seems to me that as a result of that premise that everybody agrees we have to have better coordinating roles for each and every participating user or agency regulator or those who are implementing policy. And, of course, that points toward the need for equitable comprehensive national water policy, sort of confirms what some views and perceptions that were held by each of the people that I discussed this hearing with before the hearing. Nevertheless, it is good to have it coordinated and affirm one with the other. So I feel it is very, very helpful to us in the Federal responsibility that Congress has.

Again, I want to emphasize this bill, S. 1996, is not proposed as a panacea, but this is a process bill by which we hope, through such a process, we can reach some kind of a comprehensive policy. So we are dealing with the means to the end and not the end in itself.

And so the second point is this proposal is not locked in concrete. We will certainly seek to modify to meet some of these recommendations and suggestions of all of you here today. And we would hope that you would maintain a continual interest as we see this bill moving through the committee and, hopefully, through the Congress.

Again, I want to express my deep appreciation for all the staff, for their presence, their undergirding of this hearing and to our stenotypist, Vicki Nielson, who has so carefully transcribed this hearing. This record, in its printed form, will be available in a reasonable period of time following transcription and printing. And if any of you would like a copy of it, you can certainly make that known by leaving your name and address here at the table today or asking for it later on through approaching or through soliciting through my office here in Portland or the committee office.

Anyone in the room who wishes to make a comment or who wishes to make a statement of brief type? If not, we thank each of you for being here today. It is adjourned.

[Whereupon, at 12:50 p.m., the hearing was adjourned.]

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